

JPRS-UEQ-84-002

28 March 1984

USSR Report

ENGINEERING AND EQUIPMENT

TABLES OF CONTENTS

No. 93, 22 February 1983-

No. 98, 9 November 1983

FBIS

FOREIGN BROADCAST INFORMATION SERVICE

22 February 1983

USSR REPORT
ENGINEERING AND EQUIPMENT

No. 93

CONTENTS

MARINE AND SHIPBUILDING

- Diesel Plants for Underwater Vessels
(P. A. Gordeyev; SUDOSTROYENIYE, Oct 82)..... 1
- Steam Generator Operating on Thermally Softened
Sea Water
(L. I. Sen'; SUDOSTROYENIYE, Sep 82)..... 1

NUCLEAR ENERGY

- Indicator of Energy Distribution in Field of
REMK-1000 Water-Graphite Channel Reactor
(G. N. Aleksakov, S. A. Gavril'yuk,
A. V. Kudryavtsev, G. P. Terekhov;
ATOMNAYA ENERGIYA, Oct 82)..... 3
- Stability of Nuclear Reactor With Natural Circulation
of Liquid Fuel
(V. L. Blinkin, Ye. I. Yemel'yanov; ATOMNAYA
ENERGIYA, Oct 82)..... 4
- Use of Nuclear Fuel for Covering Seasonal Peak
Electric Load on Power System
(V. M. Boldyrev, M. V. Sigal, S. A. Skvortsov;
ATOMNAYA ENERGIYA, Oct 82)..... 4
- Ways of Reorganizing Fuel Cycle in VVER-400
Water-Moderated Water-Cooled Reactor for Better Economy
(V. D. Simonov, V. I. Pavlov, S. F. Popilyuk;
ATOMNAYA ENERGIYA, Oct 82)..... 5
- Some Results of Parametric Analysis of Technical and
Economic Indicators of Power Plant with 'TROL'
Ambipolar Hybrid Fusion Reactor
(N. N. Vasil'yev, I. N. Golovin, M. G. Kuznetsov;
ATOMNAYA ENERGIYA, Oct 82)..... 6

Gas Distribution in Reactor with Pelletized Fuel Elements (A. S. Pushnov, I. I. Gel'perin, A. M. Kagan; ATOMNAYA ENERGIYA, Nov 82).....	6
Synthesis of System of Local Automatic Regulators for Power Reactors (I. Ya. Yemel'yanov, L. N. Podlazov, A. N. Aleksakov, Ye. V. Nikolayev, V. M. Panin, V. D. Rogova; ATOMNAYA ENERGIYA, Nov 82).....	7
Vibration-Shock Motion of Regulating Rods in Systems of Nuclear Reactor Control and Protection (A. I. Menyaylov; MASHTNOVEDENIYE, Nov-Dec 82).....	8
Microprocessor-Based System with Distributed Structure for Nuclear Electric Facility Radiation Monitoring (A. A. Denisov, V. S. Zhernov, I. S. Krashenninnikov, V. V. Matveyev, N. V. Ryzhov, V. M. Skatkin; ATOMNAYA ENERGIYA, Sep 82).....	8
Monitoring Radionuclide Propagation Through Process Channels of Nuclear Electric Facility (V. L. Antonov, A. A. Gruzdeva, V. S. Zhernov, S. K. Kozlov, O. B. Lapshev, V. V. Matveyev, V. V. Pushkin, M. K. Romanichev, A. Ye. Shermakov, Ye. P. Vargin, L. P. Drozdova; ATOMNAYA ENERGIYA, Sep 82)...	9
Axial and Radial Distribution of Flux Density and Hardness of Neutron Spectrum in Fuel Assemblies of VVER-365 and VVER-440 Reactors (B. A. Bibichev, V. P. Mayorov, V. D. Sidorenko, P. I. Fedotov; ATOMNAYA ENERGIYA, Sep 82).....	9
Promising Water Chemistries for Nuclear Electric Plants with VVER and RBMK Reactors (A. P. Mamet, V. A. Mamet, V. I. Pashevich, P. N. Nazarenko; ELEKTRICHESKIYE STANTSII, Jul 82).....	10
Accumulation of ^{233}U With Predetermined ^{232}U Content Upon Exposure of Thorium in VVER Power Reactor (A. A. Polyakov, V. P. Rukhlo, Yu. Ye. Titarenko, S. F. Komin; ATOMNAYA ENERGIYA, Aug 82).....	11
NON-NUCLEAR ENERGY	
Heat Pipe for Paraboloidocylindrical Solar Power Plant (I. I. Kokhova, V. Ya. Sasin, A. A. Borodkin, S. F. Ergashev; GELIOTEKHNIKA, Jul-Aug 82).....	12
Heat Storage Systems for Solar Electric Power Plants (R. B. Akhmedov, M. Ye. Voronkov, V. A. Pozharnov, V. M. Chakovskiy; GELIOTEKHNIKA, Jul-Aug 82).....	13

Production and Some Properties of Photovoltaic Cells Based on Layers of Polycrystalline Silicon (M. S. Saidov, Z. N. Alad'ina, R. Aliyev, V. P. Chirba; GELIOTEKHNIKA, Jul-Aug 82).....	14
Solar Cells Based on Polycrystalline CdTe (S. A. Azimov, Sh. A. Mirsagatov, S. A. Muzafarova; GELIOTEKHNIKA, Jul-Aug 82).....	15
Photovoltaic Cells Based on InP/CdS Heterostructure (E. S. Baleka, E. V. Gilan, L. V. Gorchak, A. D. Kitoroaga, A. G. Cheban; GELIOTEKHNIKA, Jul-Aug 82)...	16
Photovoltaic Solar Cells Based on 'Degenerate Semi- conductor - Semiconductor' P-N Heterojunctions (S. Yu. Pavelets; GELIOTEKHNIKA, Jul-Aug 82).....	16
Equations of Motion for Heliostats in Tower-Type Solar Electric Power Plant (M. N. Kachanovskiy, V. M. Dubilovich; GELIOTEKHNIKA, Sep-Oct 82).....	17
Heat Storing Devices for Solar Electric Power Plants (V. I. Gudkov, K. N. Chakalev; GELIOTEKHNIKA, Sep-Oct 82).....	18
Tests of Power Module of Paraboloidal-Cylindrical Solar Heating Plant (B. V. Arnizhevskiy, I. I. Kokhova, S. N. Aliyev, V. A. Samoylov, S. F. Ergashev; GELIOTEKHNIKA, Sep-Oct 82)..	18
Particulars of Designing and Making Controlled Reactor with Three-Dimensional Magnetic Circuit (M. L. Pil'ch, U. Sh. Galimbayev; ENERGETIK, Jul 82).....	19
Facility for Heating Power Transformers and Reactors (N. M. Nikitin, V. I. Sidorov, V. G. Sorokin, V. Ye. Gunner; ENERGETIK, Jul 82).....	20
Method of Synchronizing Wind Turbine Electric Generator With Powerful Energy System (V. V. Sidorov; ELEKTRICHESKIYE STANTSII, Jul 82).....	20

INDUSTRIAL TECHNOLOGY

Frequency Analysis of Regular Vibratory Systems in Mechanisms with Programmed Translatory Motion of Common Driven Member (I. I. Vul'fson; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE; Nov 82).....	22
---	----

Technology of Producing Linear-Displacement Gas Bearings (A. A. Rodin, V. V. Arkhipov, N. K. Balatsenko, D. D. Serebrov; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Jun 82).....	22
New Models of Industrial Robots in Action (L. I. Andreyeva; VESTNIK MASHINOSTROYENIYE, Jul 82).....	23
Pneumatic Measuring Systems for Industrial Robots (V. G. Gradetskiy; VESTNIK MASHINOSTROYENIYA, Jul 82).....	24
New Light-Beam Devices for Automatic Control of Machines (S. T. Tsukkerman; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: PRIBOROSTROYENIYE Oct 82).....	24
Dynamic Loading of Manipulation and Tilter Mechanisms in Blooming Mill 1000 (G. M. Chitorelidze, D. A. Sharashenidze; SOOBSHCHENIYA AKADEMII NAUK GRUZINSKOY SSR, May 82).....	25
Mechanism Simulating Motion of Eye Axes (P. M. Dimentberg, Yu. L. Sarkisyan; MASHINOVEDENIYE, Nov-Dec 82).....	26
Parametric Optimization of Nonlinear Vibration Isolation Systems with Aid of Multidimensional Fourier Transformation (A. V. Sinev; MASHINOVEDENIYE, Nov-Dec 82).....	26
Dependence of Complex Resonance Modes in Highly Nonlinear Vibration Systems on Amplitude of External Perturbation (B. I. Kryukov, G. I. Seredovich; MASHINOVEDENIYE, Nov-Dec 82).....	27
Theory of Optimal Control of Hydraulic Damper Based on Model of Compressible Fluid (A. S. Rivkin; MASHINOVEDENIYE, Nov-Dec 82).....	27
Calculating Unsteady Temperature Field of Rubber Bearing With Longitudinal Lubricating Grooves (A. A. Abayev, Yu. R. Osipov, A. N. Shvetsov; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE, Oct 82).....	28
Influence of Friction Forces in Engagement on Transverse Oscillations of Gears (Ye. I. Podzharov; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE, Oct 82).....	29
Determining Parameters of Two-Cylinder Lever Manipulator (V. V. Vatolin, V. V. Terekhov; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE, Oct 82).....	29

Outlook for Automating Plasma Sputtering by Using Industrial Robots and Microcomputers (A. N. Kosolapov, M. A. Aliyev; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIYE: MASHINOSTROYENIYE, Aug 82).....	30
---	----

Influence of Piston and Slide-Valve Seals on Vacuum Pump Operation (V. S. Yedemskiy; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE, Sep 82).....	30
---	----

TURBINE AND ENGINE DESIGN

Experience With Improvement of Centrifugal Compressor (B. G. Shkol'nikov, S. M. Metallikov, I. A. Gurvich, Yu. V. Byvshev; ENERGOMASHINOSTROYENIYE, Oct 82).....	32
--	----

Increased Vibration Resistance of Model K-300-240 LMZ (Leningrad Metal Works) Turbines (O. A. Lupolo, V. F. Bystrov; ENERGETIK, Oct 82).....	33
--	----

Rotary Liquid-Sleeve Vacuum-Type Compressor With Load Reliever Bushing (V. D. Dubenets, A. I. Chernykh, V. I. Kucherenko; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE, Nov 82).....	33
---	----

Centrifugal Supercharger with Arcuate Intermediate Blades (Yu. I. Petrov, V. A. Kostomarov; SUDOSTROYENIYE, Nov 82)...	34
---	----

Resultant Characteristics of Velocity Stages in Supersonic Turbines Under Variable Operating Conditions (A. M. Topunov, B. A. Tikhomirov, A. G. Genov; SUDOSTROYENIYE, Oct 82).....	34
--	----

Tuning Out Natural Vibration Frequencies of Compressor Blades for Gas Turbine Engines by Method of Successive Optimization (A. B. Roytman, V. P. Afanas'yev, T. F. Mikhaylova, S. P. Omel'chenko; PROBLEMY PROCHNOSTI, Jul 82).....	35
---	----

Stressed State of Elements of Turbomachine Blades With Holes for Banding (V. P. Sukhinin, I. B. Vol'kovich, E. V. Lukina, V. A. Malyar; PROBLEMY PROCHNOSTI, Jul 82).....	36
--	----

Theoretical Substantiation of Characteristics of Intermediate Superheat in Turbine Sets in AES (V. A. Khrustalev, V. A. Ostapenko, B. A. Arkad'yev, V. I. Fomenko; TEPLOENERGETIKA, Nov 82).....	36
---	----

Performance of Evaporator in K-500-65/3000 Turbine Set in Chernobyl'sk AES (Ye. K. Golubev, Ye. Ye. Glazov, T. G. Plokhii, V. K. Bronnikov, B. F. Vakulenko, V. S. Mikhaylov; TEPLOENERGETIKA, Nov 82).....	37
Dynamic Calculation of Rotary-Piston Compressors (B. G. Nekhoroshev; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE, Sep 82).....	38
Pneumatic Fuel Injector for Gas-Turbine Engines (A. I. Melenchuk; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE, Sep 82).....	38
NAVIGATION AND GUIDANCE SYSTEMS	
Nonlinear Systems Representing Superposition of Gyrostats (A. B. Glukhovskiy; DOKLADY AKADEMII NAUK SSSR, Oct 82).....	39
Electronic Method of Stabilizing Directivity of Hydroacoustic Antennas During Rocking (S. P. Petrov; SUDOSTROYENIYE, Nov 82).....	39
Navigation Systems With Hydroacoustic Beacons (G. E. Smirnov, N. A. Tolstyakova; SUDOSTROYENIYE, Oct 82)..	40
Procedures for Determining Transfer Functions of Nonlinear Systems on Basis of Newton-Kantorovich Method (V. R. Snurnitsin, R. T. Sulaymanov; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: PRIBOROSTROYENIYE, Oct 82).....	41
Structural-Parametric Synthesis of Nonlinear Control System According to Prescribed Motion (S. Ye. Dushin, D. Kh. Imayev, S. S. Moiseyev; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: PRIBOROSTROYENIYE, Oct 82).....	41
Accuracy of Synthesis of Approximately Optimum Control for Nonlinear Object (Ye. Ye. Aleksandrov, M. V. Trigub; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: PRIBOROSTROYENIYE, Oct 82).....	42
Selection of Optimum Correction Characteristic for Vertical Gyro From Computer Printouts (M. A. Sergeyev; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: PRIBOROSTROYENIYE, Jun 82).....	42
Method of Determining Natural Frequencies of Gyromotor From Parameters of Its Vibration (A. Yu. Belyayev, V. Ye. Petrenko, Yu. V. Radysh; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: PRIBOROSTROYENIYE, Jun 82).....	43

Use of Bi-Oscillatory Scheme in Float-Type Cyroscopic Devices (V. M. Pankratov; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: PRIBOROSTROYENIYE, Jun 82).....	44
Selecting Weight Factors in Problems of Optimum Damping of Elastic Wing Oscillations (T. K. Sirazetdinov, I. Kh. Khalitov; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Apr-Jun 82).....	44
Applying Phase Biplane Method to Stability Study of Spacecraft With Rotary Control System (Yu. N. Pavlov, L. V. Severova; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Apr-Jun 82).....	45
Dynamics of Nonlinear Gyro Systems With Polyharmonic and Random Base Oscillations (N. V. Butenin, A. M. Lestev; IZVESTIYA VYSSHIKH ZAVEDENIY: PRIBOROSTROYENIYE, Aug 82).....	45
Influence of Rotor Radius on Accuracy of Electrostatic Gyroscope in Cardan Suspension (Yu. G. Martynenko, A. V. Koretskiy; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: PRIBOROSTROYENIYE, Aug 82).....	46
HIGH-ENERGY DEVICES, OPTICS AND PHOTOGRAPHY	
Technology of Concentrator Assembly From Mirror-Glass Elements (G. Ya. Umarov, D. N. Alabutdinov, A. Abduzizov, A. Abdullayev, A. K. Alimov; GELIOTEKHNIKA, Jul-Aug 82).....	47
Magnetically Controlled Vacuum-Tube Displacement-To-Pulse Converter (N. M. Bondar'; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: PRIBOROSTROYENIYE, Oct 82).....	48
Optical Image Synthesizer With Magnetoelectric Light Modulator (L. V. Gavrilov, A. G. Korobov, G. P. Pominov, Yu. V. Fedorov, V. V. Khvalovskiy; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: PRIBOROSTROYENIYE, Jun 82).....	48
Automatic Focusing in Single-Mirror Two-Dimensional Laser-Mirror Scanners (A. L. Il'in, B. S. Rozov, P. I. Savostin; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: PRIBOROSTROYENIYE, Jun 82).....	49

Investigation of Parabolic Glass-Ceramic Astronomical Mirror Working Surface Quality (D. T. Puryayev, V. A. Gorshkov, O. N. Fomin, V. G. Lysenko; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Aug 82).....	50
Method for Automatic Compensation of Geometric Distortions in Astronomical Television Equipment (V. A. Kachmin, Yu. A. Seliverstrov; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST, Aug 82).....	50
Optical Goniometric Systems of Multiplier Type (P. A. Mikheyev; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Aug 82).....	51
Mechanism of Ion Acceleration in Laser Plasma (A. Sh. Abdullayev, A. A. Asrorov, A. A. Frolov; (DOKLADY AKADEMII NAUK TADZHIKSKOY SSR, Apr 82).....	52
Formation of Fine-Structure Image by Corner Reflectors Operating on Total Internal Reflection Principle (G. V. Denisyuk, V. I. Korneyev; OPTIKO- MEKHANICHESKAYA PROMYSHLENNOST', Sep 82).....	52
Evaluating Parameters of Shadow Instruments With Photoelectric Information Conversion (A. S. Avramenko, T. M. Bezdudnyaya, E. Yu. Durovich, E. I. Krasovskiy; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Sep 82).....	53
Mathematical Modeling of Geometric Shape of Polyhedral Fiber-Optics Components (N. I. Isayev, I. A. Shirkova; OPTIKO- MEKHANICHESKAYA PROMYSHLENNOST', Sep 82).....	54
Optical Schemes of Laser Scanning Devices (L. A. Markova, V. P. Mikheyev, B. S. Rozov, P. I. Savostin; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Sep 82).....	54
Studying Gain of Electron Flux in Microchannel Plate (Ye. P. Semenov; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Sep 82).....	55
Automated Goniometer Based on Ring Laser (A. I. Vanyurikhin, I. I. Zaytsev; OPTIKO- MEKHANICHESKAYA PROMYSHLENNOST', Sep 82).....	55

FLUID MECHANICS

Mathematical Modeling of Gas Dynamic Processes at Gate Valve in Reciprocating Compressor (G. A. Baryshnikov, V. P. Levshin; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, Nov 82).....	56
Penetration of Thin Cyclinder With Thin Nose Cone Into Ponderable Fluid (S. G. Avagyan; IZVESTIYA AKADEMII NAUK ARMYANSKOY SSR: MEKHANIKA, Jul-Aug 82).....	57
Diffraction of Acoustic Wave by Plate Moving Near Plane (Ye. A. Krasil'shchikova; DOKLADY AKADEMII NAUK SSSR, Aug 82).....	57
Investigation of Aerodynamic Characteristics of Diamond-Shaped Wing Vibrating Translationally in Supersonic Flow (A. N. Varnavskiy; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, Apr-Jun 82).....	58
Investigation of Wing Vortex Schemes (V. I. Men'shikov, M. M. Ovcharov; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, Apr-Jun 82).....	59
Interaction of System of Jets Incident on Flat Obstacle (V. V. Startsev, N. I. Syromyatnikov, A. M. Poletayev; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, Apr-Jun 82).....	59

MECHANICS OF SOLIDS

Resonance Vibrations of Rotors at High Speeds (V. B. Bal'mont; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, Nov 82).....	60
Stressed and Strained State of Triple-Layer Beam Under Longitudinal Impulse Load (V. N. Kobelev, V. U. Kotel'nikov, A. A. Zholudev, V. V. Deryushev; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, Nov 82).....	60
Effect on Initial Loss of Shape on Natural Vibration Frequencies of Reinforced Conical Shells (S. Yu. Fialko; PRIKLADNAYA MEKHANIKA, Nov 82).....	61

Stability of Flexible Shallow Shells of Rectangular Planform Under Thermal Shock (V. A. Krys'ko, P. B. Fedorov; PRIKLADNAYA MEKHANIKA, Nov 82).....	62
Numerical Analysis of Wave Processes in Composite Shell-Beam Structures (V. I. Patsyuk, G. A. Ryabkova, P. F. Sahodash; (PRIKLADNAYA MEKHANIKA, Nov 82).....	62
Stresses State of Laminate-Wound Cylindrical Shell With Friction (L. A. Il'in, N. A. Lobkova; PRIKLADNAYA MEKHANIKA, Nov 82).....	63
Effective Coefficients of Non-Coulomb Dry Friction Under Vibration (G. Ya. PANOVKO, I. N. Tskhakaya; SOOBShCHENIYA AKADEMII NAUK GRUZINSKOY SSR, May 82).....	63
Factor Favorable to Occurrence of Vibrations With Traveling Strain Waves in Cyclically Symmetric Systems (N. P. Aleshin; PROBLEMY PROCHNOSTI, Jul 82).....	64
Experimental Determination of Stresses in Layers of Multilayer Reeled Shell (M. I. Burak; PROBLEMY PROCHNOSTI, Jun 82).....	65
Design of Reeled Multilayer Cylinder for Equal Strengths of Turns (A. F. Bezverbnyy; PROBLEMY PROCHNOSTI, Jun 82).....	65
Design of Thin-Walled Pressure Vessels for Resistance to Fracture (V. P. Shirshov; PROBLEMY PROCHNOSTI, Jun 82).....	66
Effect of Different Tensile and Compressive Resistances of Nonlinearly Elastic Material to Stress and Strain in Cylindrical Shell (A. F. Makeyev, I. G. Ovchinnikov; PROBLEMY PROCHNOSTI, Jun 82).....	66
Stability of Multilayer Cylindrical Shells Made Up of Orthotropic Layers (K. A. Abdulkhakov, S. B. Cherevatskiy; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, Apr-Jun 82).....	67
Calculation of Spherical Shell With Inversely Symmetric Loading (I. S. Akhmed'yanov; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, Apr-Jun 82).....	68

Some Particulars of Loss of Stability of Ribbed Cylindrical Shells (S. N. Kan, Yu. I. Kaplan, V. I. Ostrovitskiy; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Apr-Jun 82).....	68
Solution of Thermoelastic Problem for Arbitrarily Shaped Shell of Revolution (V. V. Kuz'min; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Apr-Jun 82).....	69
Bending of Plates and Shells With Variable Stiffness (V. A. Krys'ko, V. V. Bochkarev; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE, Sep 82).....	69
Deriving Canonical Equations for Multilayered Shells of Revolution Made of Materials With Nonlinear Elasticity (B. G. Popov; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE, Sep 82).....	70
Carrying Capacity of Spherical Sandwich Shells Under Dynamic Loading (V. U. Kotel'nikov, V. N. Kobelev; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE, Sep 82).....	70
Principles of Method of Calculating Permissible Imbalances From Modes of Vibrations of Flexible Rotors (V. N. Barke, I. E. Krantsberg; VESTNIK MASHINOSTROYENIYE, Aug 82).....	71
Controlled Speedup of Unbalanced Rotor Through Critical Velocity (A. P. Zobnin, L. M. Malinin, D. B. Tanayev; VESTNIK MASHINOSTROYENIYE, Sep 82).....	72

TESTING AND MATERIALS

New Stainless Steels for Atomic Power Equipment (I. R. Kryanin, A. V. Ryabchenkov, V. I. Gerasimov, I. L. Kharina; ENERGOMASHINOSTROYENIYE, Oct 82).....	73
Pneumatic Instrument for Measuring Radii of Lenses (V. P. Zakharov, V. M. Kravchuk, A. V. Perov, V. I. Shevelev; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Jun 82).....	74

New Microalloy Steels for Large Propeller Shafts (V. S. Pestov, B. A. Osminin, G. N. Filimonov; SUDOSTROYENIYE, Oct 82).....	74
Use of Magnetic Systems for Increasing Efficiency of Electron-Beam Bombardment of Cylindrical Objects (L. L. Akrachkova, N. K. Kuksanov, R. A. Salimov, Yu. N. Timko, E. E. Finkel'; ATOMNAYA ENERGIYA, Nov 82).....	75
Effect of Ultrasonic Treatment on Flexural Stains in Plates Made of D16 and V95 Aluminum Alloys (G. Ya. Bazelyuk, A. M. Lyubchik, S. Ya. Matsiyevskaya, G. A. Petrunin, L. V. Tikhonov; PROBLEMY PROCHNOSTI, Jun 82).....	75
Experimental Facility for Studying Kinematic Accuracy of Devices for Motion Conversion in High Vacuum (S. G. Borisov, S. N. Istomin, M. I. Nekrasov; VESTNIK MASHINOSTROYENIYA, Sep 82).....	76
Antistatic and Abrasion-Resistant Coating for Polymer Optical Components With Complex Surface Profile (G. A. Aleksandrov, N. Z. Khaliullina, V. V. Polezhayev, N. P. Anokhina; OPTIKO- MEKHANICHESKAYA PROMYSHLENNOST', Sep 82).....	77

20 April 1983

USSR REPORT ENGINEERING AND EQUIPMENT

No. 94

CONTENTS

NUCLEAR ENERGY

Use of Large-Scale Preassembly in Building the Third Generating Facility of Kursk Nuclear Electric Power Plant (Yu. A. Men'kin, et al.; ENERGETICHESKOYE STROITEL'STVO, Sep 82).....	1
Thermal Economy of Nuclear Heat and Electric Power Stations With TK-450/500-60 Turbines (V. I. Vodichev, et al.; TEPLOENERGETIKA, Aug 82).....	1
Regulating Heat Output From Nuclear Heat Supply Stations (N. M. Zinger, et al.; TEPLOENERGETIKA, Aug 82).....	2
Startup, Adjustment and Early Period of Operation for Fifth Unit of Novovoronezhsk Nuclear Electric Plant (V. A. Zverev, et al.; TEPLOENERGETIKA, Jul 82).....	2
Behavior of Gaseous and Organic Impurities in Coolant of Nuclear Electric Plants With RBMK Reactors (V. A. Mamet, et al.; TEPLOENERGETIKA, Jul 82).....	3
Equipment Complex for Monitoring Neutron Flux of Reactor Control System in Water-Cooled Water-Moderated Power Reactors of Nuclear Electric Plants (G. F. Borovik, et al.; ATOMNAYA ENERGIYA, Jan 83).....	4
Using Variational Method of Calculating Plasma Equilibrium in Tokamak for Consistent Solution of Problems of Equilibrium Evolution and Heat Transfer (V. K. Kolesnikov, V. D. Khait; ATOMNAYA ENERGIYA, Jan 83)...	4
Comparing Technical-Economic Characteristics of Nuclear Electric Plants With Modern Thermal and Fast Reactors (A. A. Rineyskiy; ATOMNAYA ENERGIYA, Dec 82).....	5

Calculations of Physical Characteristics of RBMK Reactors in Transition Period (V. S. Romanenko, A. V. Krayushkin; ATOMNAYA ENERGIYA, Dec 82).....	5
Radiation Environment of Fifth Phase of Novo-Voronezh Nuclear Electric Plant During Startup and Bringing Up To Power (N. A. Verkhovetskiy, et al.; ATOMNAYA ENERGIYA, Dec 82)...	6
Surface Analysis and Erosion of Graphite Diaphragm in T-3M Tokamak in Intermittent Operation (D. G. Baratov, et al.; ATOMNAYA ENERGIYA, Dec 82).....	7

NON-NUCLEAR ENERGY

Using Microprocessor Controlling Complexes in Automated Systems for Control of Technological Processes in Generating Units of Nuclear and Fossil-Fuel Electric Power Plants (V. I. Gritskov, et al.; TEPLOENERGETIKA, Oct 82).....	8
Calculating Efficiency of Thermoelectric Generator (Ye. G. Pokornyy, Ye. K. Iordanishvili; GELIOTEKHNIKA, Nov-Dec 82).....	9
Investigation of Deformational Faceting (S. A. Azimov, et al.; GELIOTEKHNIKA, Nov-Dec 82).....	9
Light Losses in Prism Concentrators (K. V. Zhukov, E. V. Tver'Yanovich; GELIOTEKHNIKA, Nov-Dec 82).....	10
Development of Large Heliostat and Investigation of Its Energy Characteristics (R. A. Zakhidov, et al.; GELIOTEKHNIKA, Nov-Dec 82).....	10
Energy Characteristics of Experimental Module of Parabolic Cylinder Solar Facility (B. V. Tarnizhevskiy, et al.; GELIOTEKHNIKA, Nov-Dec 82)...	11
Results of Heat and Mass Exchange Process Study in Subsoil Pebble-Regenerative Storage Unit of Block Solar Greenhouse (A. B. Bardiashvili, B. Khayritdinov; GELIOTEKHNIKA, Nov-Dec 82).....	12
Regulation of Heliosystems With Forced Circulation of Coolant (A. R. Fert; GELIOTEKHNIKA, Nov-Dec 82).....	12
Optimizing Temperature Conditions of Solar Energy Receivers (Yu. N. Yakubov, A. I. Imamkulov; GELIOTEKHNIKA, Nov-Dec 82).....	13

Accuracy of Determining Solar Radiation Intensity in Calculating Helionic Units (M. I. Valov, et al.; GELIOTEKHNIKA, Nov-Dec 82).....	13
Choosing the Roof Pitch of Block Hothouses (T. Sadykov, et al.; GELIOTEKHNIKA, Nov-Dec 82).....	14

INDUSTRIAL TECHNOLOGY

Speed Optimization of Automatic Manipulator With Consideration of Output Component Elasticity (N. A. Arkhipenko, et al.; VESTNIK MASHINOSTROYENIYA, Jan 83).....	15
Investigation of Lens Distributor of Controllable Axial-Piston Pump (M. G. Kabakov, et al.; VESTNIK MASHINOSTROYENIYA, Jan 83)..	15
Tests of Hydrodynamic Thrust Bearing With Collar Base and Profiled Butt Plate Working Surface (Ya. I. Gritsenko, et al; VESTNIK MASHINOSTROYENIYA, Jan 83).....	16
Dynamic Loads in High-Torque Multiple-Motor Integrator Drives (B. Ye. Zhitomirskiy, et al.; VESTNIK MASHINOSTROYENIYA, Jan 83).....	17
Effectiveness of Check Equipment in Automatic Assembly Units (K. I. Semyshev; VESTNIK MASHINOSTROYENIYA, Jan 83).....	17
Calculating Operational Dimensions of Workpieces in Cold Extrusion and Calibration (M. Ye. Popov; VESTNIK MASHINOSTROYENIYA, Jan 83).....	18
Artificial Intelligence System for Technology Planning (N. G. Bruyevich, et al.; MASHINOVEDENIYE, Jan-Feb 83).....	18
Investigation of Row Type Ball Autobalancer (V. I. Kravchenko; MASHINOVEDENIYE, Jan-Feb 83).....	19
Motion of Mating Parts in Automatic Assembly (I. V. Dzhahalova; MASHINOVEDENIYE, Jan-Feb 83).....	19
Calculation and Investigation of Axial Gas Static Bearing With Elastic Compensators (V. A. Kodnyanko, et al.; MASHINOVEDENIYE, Jan-Feb 83).....	20
Calculating Static and Dynamic Characteristics of Annular Gas Static Thrust Bearing With Microgroove (V. A. Mordvinkin, A. I. Snopov; MASHINOVEDENIYE, Jan-Feb 83).....	20

Studies of Mechanical Transmissions for Electromechanical Modules of Industrial Robots (N. A. Lakota, et al.; VESTNIK MASHINOSTROYENIYA, Oct 82)...	21
Methods of Braking Pneumodrive of Industrial Robot (A. A. Paroy; VESTNIK MASHINOSTROYENIYA, Oct 82).....	21
Static Characteristics of Hybrid Bearing With Two Feed Slots (A. S. Kel'zon, et al.; VESTNIK MASHINOSTROYENIYA, Oct 82)..	22
Selection of Characteristics of Damping Devices for Automatic Manipulators (V. M. Guslits; MEKHAIZATSIIYA I AVTOMATIZATSIIYA PROIZVODSTVA, Jun 82).....	22
Development and Investigation of Industrial Robots Based on Z-Coordinates (A. Sh. Koliskor; STANKI I INSTRUMENT, Dec 82).....	23
Robot Activation Sensors (V. V. Klyuyev; PRIBORY I SISTEMY UPRAVLENIYA, Jan 83).....	23
Development of Versatile Automatic Production Plants (A. I. Korendyasev; STANKI I INSTRUMENT, Jan 83).....	24
Dynamic Characteristics of Electrohydraulic Positional Drive for Robotic Systems (Ye. A. Tsukhanova, Ye. Ya. Vinit'skiy; STANKI I INSTRUMENT Jan 83).....	24
Hydrostatic Bearing for Heavy-Duty Boring Mill Spindle (V. A. Prokopenko, et al.; STANKI I INSTRUMENT, Jan 83).....	25
Improving Stability of Technical Parameters of Electromagnetic Geared Couplings (V. I. Aleksandrov, V. I. Suslov; STANKI I INSTRUMENT, Jan 83).....	25
Errors of Bearing Ring Faces in Bilateral Surface Grinding (S. S. Shakhnovskiy; STANKI I INSTRUMENT, Jan 83).....	26
Designing Systems for Controlling Automatic Transfer Machines Based on Programmable Command Units (I. N. Mikov, et al.; STANKI I INSTRUMENT, Nov 82).....	26
Microprocessor Control of Automatic Equipment on Machine Tools With Present Numerical Control (V. L. Sosonkin; STANKI I INSTRUMENT, Nov 82).....	27
Making Pipes of Churlish Materials on Electrochemical Turret Machine Tool (G. G. Gevorkyan, A. Sh. Bayramyan; STANKI I INSTRUMENT, Nov 82).....	27

TURBINE AND ENGINE DESIGN

- Ventilation Process in Axial Turbomachine Stage
(V. M. Neuymin, I. P. Usachev; ENERGO MASHINOSTROYENIYE,
Nov 82)..... 28
- Experimental Investigation of High-Speed Turbomachine Journal
Bearings With Self-Adjusting Blocks
(V. A. Maksimov, et al.; ENERGO MASHINOSTROYENIYE, Nov 82)... 28
- Vibrostrength of GTN-25 Compressor Rotor Vanes
(D. M. Bavel'skiy, et al.; ENERGO MASHINOSTROYENIYE,
Nov 82)..... 29

NAVIGATION AND GUIDANCE SYSTEMS

- Determining Orientation of Instrument Trihedron From Data
on Angles
(A. I. Tkachenko; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA
TVERDOGO TELA, Nov-Dec 82)..... 30
- Steady Motion of Gyrostat With Deformable Plates and Motion
Stability in Newtonian Central Force Field
(M. K. Nabiullin; IZVESTIYA AKADEMII NAUK SSSR:
MEKHANIKA TVERDOGO TELA, Nov-Dec 82)..... 31
- Nonlinear Resonances in Problem of Movement of Body Around
Center of Mass Under Action of Lorentz Forces
(N. V. Chikova; VESTNIK LENINGRADSKOGO UNIVERSITETA:
MATEMATIKA, MEKHANIKA, ASTRONOMIYA, Jan 83)..... 31

HIGH-ENERGY DEVICES, OPTICS AND PHOTOGRAPHY

- Superconducting Solenoid for Electron-Paramagnetic-Resonance
Spectrometer
(V. I. Kurochkin, et al.; PRIBORY I TEKHNIKA EKSPERIMENTA,
Nov-Dec 82)..... 32
- Thyratron-Thyristor Generator of Pumping Pulses for Metal-Vapor
Lasers
(S. P. Dashuk, S. Ye. Potapov; PRIBORY I TEKHNIKA
EKSPERIMENTA, Nov-Dec 82)..... 32
- Electron Gun With Plasma Emitter Formed by Vacuum-Discharge Arcs
(S. P. Bugayev, et al.; PRIBORY I TEKHNIKA EKSPERIMENTA,
Nov-Dec 82)..... 33
- High-Voltage Long-Focus Electron Gun
(N. N. Veniaminov, et al.; PRIBORY I TEKHNIKA
EKSPERIMENTA, Nov-Dec 82)..... 34

Pulsed Electron Accelerator in Which Beam of Large Cross Section Is Coupled Out Into Atmosphere (M. A. Abroyan, et al.; PRIBORY I TEKHNICA EKSPERIMENTA, Sep-Oct 82).....	34
Precision Stabilizer of Current in Main Cyclotron Winding for Operation in Multiply Connected Control System (V. I. Sakhno, et al.; PRIBORY I TEKHNICA EKSPERIMENTA, Sep-Oct 82).....	35
Gun Power Supply and Control System for High-Current Pulsed Electron Accelerator (Yu. G. Bamburov, I. V. Kazarezov; PRIBORY I TEKHNICA EKSPERIMENTA, Sep-Oct 82).....	35
Aligning Laser Beams on Spherical Target in Del'fin-1 Facility (N. G. Basov, et al.; PRIBORY I TEKHNICA EKSPERIMENTA, Sep-Oct 82).....	36
Ion Source for MI-1201 Mass Spectrometer (I. A. Rat'kovskiy, et al.; PRIBORY I TEKHNICA EKSPERIMENTA, Sep-Oct 82).....	37
Influence of Radial Diffusion on Possible Erosion of Open Trap Plasma (V. G. Petrov; ATOMNAYA ENERGIYA, Jan 83).....	37
Radiation Environment on the 16 MeV Microtron Accelerator (A. G. Belov, et al.; ATOMNAYA ENERGIYA, Jan 83).....	38
Electromagnetic Mass Separator for Radioisotope Separation (R. I. Lyubtsev, et al.; ATOMNAYA ENERGIYA, Jan 83).....	39
Plastic Scintillators for Registration of Fast Neutrons (D. V. Viktorov, et al.; ATOMNAYA ENERGIYA, Jan 83).....	39
Improving Efficiency of Using Neutron Flux in Neutron- Activation Facility With Central Placement of Californium Source (B. S. Vakhtin, G. A. Kuznetsov; ATOMNAYA ENERGIYA, Jan 83)..	40
Additional Radiation Factors on High-Current Electron Accelerators (L. F. Belovodskiy, et al.; ATOMNAYA ENERGIYA, Jan 83).....	41
Using Counter With Plastic Scintillator to Measure High-Energy Neutron Spectra (V. Ye. Aleynikov, et al.; ATOMNAYA ENERGIYA, Jan 83).....	41
Direct Conversion of Charged Particle Energy in System Comprising Conical Magnetic Expander and Flat Collector (S. K. Dimitrov, A. V. Makhin; ATOMNAYA ENERGIYA, Dec 82)....	42

FLUID MECHANICS

- Nonsteady Three-Dimensional Hypersonic Flow of Relaxing Gas
Around Thin Wing
(M. M. Kuznetsov; DOKLADY AKADEMII NAUK SSSR, Oct 82)..... 43
- Asymptotic Solution Near Shock Layer Detachment Point in
Hypersonic Flow Around Pointed Bodies
(V. G. Ignatenko; VESTNIK LENINGRADSKOGO UNIVERSITETA:
MATEMATIKA, MEKHANIKA, ASTRONOMIYA, Jan 83)..... 43
- Pressure on Flat Arbitrarily Oriented Surface in Strongly
Underexpanded Rarefied Gas Jet Flow
(B. F. Panov; VESTNIK LENINGRADSKOGO UNIVERSITETA:
MATEMATIKA, MEKHANIKA, ASTRONOMIYA, Jan 83)..... 44

MECHANICS OF SOLIDS

- Self-Excited Oscillations in Systems With Inertial Excitation
(V. I. Babitskiy, P. S. Landa; DOKLADY AKADEMII NAUK SSSR,
Oct 82)..... 45
- Characteristics of Wave Field in Semiinfinite Elastic Cylinder
(Boundary Resonance)
(V. T. Grinchenko, V. V. Meleshko; IZVESTIYA AKADEMII
NAUK SSSR: MEKHANIKA TVERDOGO TELA, Nov-Dec 82)..... 46
- Optimum Control of Periodic Vibrations for Vibration and
Shock System
(A. S. Kovaleva; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA
TVERDOGO TELA, Nov-Dec 82)..... 46
- Theory of Vibratory Displacement Due to Anharmonic Excitation
(L. V. Bepalova, V. S. Metrikin; IZVESTIYA AKADEMII
NAUK SSSR: MEKHANIKA TVERDOGO TELA, Nov-Dec 82)..... 47
- Quenching Plane Vibrations of Platform by Means of Unbalance-
Type Suppressors
(V. I. Babitskiy, V. Sh. Burd; IZVESTIYA AKADEMII NAUK
SSSR: MEKHANIKA TVERDOGO TELA, Nov-Dec 82)..... 47
- Periodic Oscillations of System With Two Degrees of Freedom
Striking Against Absolutely Inelastic Stop
(Yu. V. Belyayev, T. Ya. Gert; MASHINOVEDENIYE, Jan-Feb 83).. 48
- Solitons in Appreciably Nonlinear Systems of Impact Type
(Ye. G. Bedenova; MASHINOVEDENIYE, Jan-Feb 83)..... 48
- Excitation of Oscillations in Moving Elastic Structural
Elements
(A. I. Vesnitskiy, S. V. Krysov; MASHINOVEDENIYE,
Jan-Feb 83)..... 49

Vibroactivity of Annular Mechanisms With Consideration of Impacts in Gaps (I. I. Vul'fson, et al.; MASHINOVEDENIYE, Jan-Feb 83).....	49
Analyzing Resonance Conditions in Nonlinear Oscillatory Systems (V. L. Krupenin; MASHINOVEDENIYE, Jan-Feb 83).....	50
Method of Measuring Spatial Oscillations of Vibration Devices (V. B. Matveyev, B. E. Fridman; MASHINOVEDENIYE, Jan-Feb 83).....	50
Elastic-Plastic Calculation of Stressed State of Lens Compensators During Bending and Combined Bending With Axisymmetric Loads (V. I. Berlyand; MASHINOVEDENIYE, Jan-Feb 83).....	51
Loss of Stability of Spherical Shells (V. I. Babenko; DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA A: FIZIKO-MATEMATICHESKIYE I TEKHNICHESKIYE NAUKI, Oct 82).....	51
Principal Nonlinear Equations in Theory of Imperfect Ribbed Shells of Revolution (G. D. Gavrilenko; DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA A: FIZIKO-MATEMATICHESKIYE I TEKHNICHESKIYE NAUKI, Oct 82).....	52
TESTING AND MATERIALS	
Instrument for Measuring Velocity of Acoustic Waves in Solids (A. I. Korobov, et al.; PRIBORY I TEKHNIKA EKSPERIMENTA, Nov-Dec 82).....	53
Finishing Steels With Abrasive Pastes Containing Water Condensate (V. V. Maslovskiy, et al.; VESTNIK MASHINOSTROYENIYE, Jan 83).....	53
Method of Checking Axial Tightness of Ball Bearing by Measurements of Support Stiffness (V. Ye. Petrenko; MASHINOVEDENIYE, Jan-Feb 83).....	54
Ultrahigh-Vacuum Helium Evaporative Cryopump (B. Z. Kanter, A. V. Kozhukhov; PRIBORY I TEKHNIKA EKSPERIMENTA, Sep-Oct 82).....	55
Measuring Radial Forces in Rotor Bearings (V. K. Grinkevich, et al.; VESTNIK MASHINOSTROYENIYA, Oct 82).....	55

Selective Optical Coatings Based on Black Oxide Films of Cobalt Produced by Pyrolysis (M. M. Koltun, et al.; GELIOTEKHNKA, Nov-Dec 82).....	56
Absolute Receiver for Measuring Solar Radiation Density in Vacuum (L. Ya. Paderin, et al.; GELIOTEKHNKA, Nov-Dec 82).....	56

USSR REPORT
ENGINEERING AND EQUIPMENT

No. 95

CONTENTS

AERONAUTICS AND SPACE

- Mechanics of Aircraft Maneuvering With Rotation of Propulsion
System Thrust Vector
(I. F. Obratsov, et al.; DOKLADY AKADEMII NAUK SSR,
Dec 82)..... 1

MARINE AND SHIPBUILDING

- Electrohydrojet Propulsion FPR Ships
(A. P. Baranov, et al.; SUDOSTROYENIYE, Dec 82)..... 2
- Self-Centering Elastic Bearing Supports for Shaft Extensions
on Ships
(Yu. A. Vyazovoy, P. A. Garashchenko; SUDOSTROYENIYE,
Dec 82)..... 3
- Optimization of Automatic Control of Marine Engines
(S. A. Antonovich; SUDOSTROYENIYE, Jan 83)..... 3

NUCLEAR ENERGY

- Automated System for Controlling Technological Processes of
Unified Nuclear Power Plants
(M. P. Shal'man; ELEKTRICHESKIYE STANTSII, Dec 82)..... 5
- Complexon Water Chemistry of Nuclear Power Plant Steam Raisers
(A. S. Monakhov; TEPLONERGETIKA, Dec 82)..... 6
- Study of Level Change in Nuclear Powerplant Condenser Bubblers
(V. N. Antropov, A. M. Bukrinskiy; TEPLONERGETIKA,
Feb 83)..... 7

Influence of Hydrogen on Brittle Fracture Tendency of Welded VVER-1000 Nuclear Reactor Body Joints (R. Ye. Mazel', et al.; TEPLOENERGETIKA, Feb 83).....	7
Experience in Hydrazine Mode Start up at Kola Nuclear Powerplants (V. A. Mamet, et al.; TEPLOENERGETIKA, Feb 83).....	8
Test Stand Operation of Experimental Evaporative Channels for First Power Unit of Beloyarsk Nuclear Powerplant (V. N. Tyurin, et al.; TEPLOENERGETIKA, Feb 83).....	8
Vertical Direct Flow Steam Generator for VVER-Nuclear Powerplant (V. P. Glebov, et al.; TEPLOENERGETIKA, Feb 83).....	9
Technico-Economic Model of Centralized Heat Supply System on Basis of AES (B. V. Yakovlev, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: ENERGETIKA, Dec 82).....	10
Some Results of Experimental Studies Pertaining to Operation of VVER-1000 Water-Moderated Water-Cooled Power Reactor Unit With Sliding Initial Steam Pressure (V. A. Ivanov, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: ENERGETIKA, Dec 82).....	10
Outlook for Using Gas-Turbine Units in Facilities With High-Temperature Gas-Cooled Reactors (V. S. Beknev, et al.; ENERGO Mashinostroyeniye, Feb 83).....	11
Role of Physical Fast Reactor Characteristics in Limiting Consequences of Hypothetical Accidents (I. A. Kuznetsov, et al.; ATOMNAYA ENERGIYA, Feb 83).....	12
Kinetics of Two Tightly Coupled Pulsed Reactors (V. N. Bugrov, S. A. Karamyan; ATOMNAYA ENERGIYA, Feb 83).....	12
Comparative Neutron-Physics Calculations of Fast Reactors (Y. D. Yordanov, N. A. Antonov; ATOMNAYA ENERGIYA, Feb 83).....	13
NON-NUCLEAR ENERGY	
Structure of Program for Controlling Start of Steam Turbine Taking Into Account Variation in Elongation of Rotor (V. L. Pokhoriler, et al.; TEPLOENERGETIKA, Dec 82).....	14

Use of Solar Energy To Produce Low Potential Heat (M. I. Valov; ELEKTRICHESKIY STANTSII, Mar 83).....	15
Study of Pneumotransport Systems (Yu. N. Vtyurin; TEPLOENERGETIKA, Mar 83).....	16
Influence of Climatic Factors on Operation and Power Indices of Heat Supply System Equipment (D. T. Arshakyan; TEPLOENERGETIKA, Feb 83).....	16
Selection of Power Level of Prime Movers for Electric Generators (B. I. Stukov; SUDOSTROYENIYE, Jan 83).....	17
Basic Theory of Controllable Power Reactors (L. I. Dorozhko, M. S. Libkind; IZVESTIYA AKADEMII NAUK SSSR: ENERGETIKA I TRANSPORT, Sep-Oct 82).....	17
Core-Type and Shell-Type Shunting Reactors With Nonmagnetic Gaps (N. P. Kostritskaya, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ENERGETIKA, Dec 82).....	18
Stock Modules for Trailer Homes With Self-Contained Solar Power Supply (A. N. Sakharov, et al.; GELIOTEKHNIKA, Jan-Feb 83).....	18
Tracking Transducers With Fiber Optics for Solar Power Plants (Yu. N. Sizov, et al.; GELIOTEKHNIKA, Jan-Feb 83).....	19
Simple Mathematical Model of Operation of Solar Radiation Collector for Heating System in a Building (V. A. Nikiforov; GELIOTEKHNIKA, Jan-Feb 83).....	19
Experimental Study of Solar Refrigerator (A. Kakabayev, et al.; GELIOTEKHNIKA, Jan-Feb 83).....	20
Pattern of Heat Load Distribution in Heat Supply System During Operation of Solar Power Plant (M. I. Valov, L. A. Shopenskiy; GELIOTEKHNIKA, Jan-Feb 83).....	21
Construction of Experimental Solar Steam Generator for Experimental 5 MW Solar Electric Power Plant (D. L. Itman, et al.; GELIOTEKHNIKA, Jan-Feb 82).....	21
Solar-Fuel Hybrid Electric Power Plants Based on Marginal Natural-Gas Deposits in Uzbekistan (G. Ya. Umarov; GELIOTEKHNIKA, Jan-Feb 82).....	22

Optimization of Radiation Concentration Factor in Solar Photoelectric Power Plants (V. A. Grilikhes, et al.; GELIOTEKHNIKA, Jan-Feb 83).....	23
Photovoltaic Solar Cells of Heterojunction Type With Schottky Barrier (S. A. Azimov, et al.; GELIOTEKHNIKA, Jan-Feb 83).....	23
Feasibility of Increasing Specific Power of Photoelectric Concentrator Modules Containing AlGaAs Heterophotovoltaic Cells (Kh. K. Airpov, et al.; GELIOTEKHNIKA, Jan-Feb 83).....	24
Electrodes Made of Polycrystalline CdSe for Regenerative Photoelectrochemical Converters (T. A. Vardapetyan, et al.; GELIOTEKHNIKA, Jan-Feb 83)...	25
Mobile Reserve Electric Power Supply Based on K-701 Tractor With Electric Power Takeoff System (N. F. Molosnov, B. I. Kuritsa; ENERGETIK, Feb 83).....	26

CONSTRUCTION

Design of Natural Illumination for Buildings With Aid of Universal Nomograms (Kh. Nuretdinov, R. A. Kuchkarov; GELIOTEKHNIKA, Jan-Feb 83).....	27
---	----

INDUSTRIAL TECHNOLOGY

Excitation of Oscillations in Automatic Control Systems With Periodic Delay (G. A. Vol'dek, V. E. Shmakov; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PRIBOROSTROYENIYE, Feb 83).....	28
Analysis of Discrete Systems With Random Closure Intervals (L. S. Madorskiy; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PRIBOROSTROYENIYE, Feb 83).....	28
Analysis of Actuating Systems of Automated Forging Manipulators (A. A. Mishulin, et al.; ENERGOMASHINOSTROYENIYE, Feb 83).....	29

TURBINE AND ENGINE DESIGN

Inflow of Steam From End Seals to Turbine Blades (V. G. Orlik, et al.; TEPLOENERGETIKA, Dec 82).....	30
---	----

Effectiveness of Use of Shaped Twisted Tubes in Heat Exchangers of Turbine Plants (Yu. M. Brodov; TEPLOENERGETIKA, Dec 82).....	31
Verifying Analysis of Multistage Steam Turbines (Ya. A. Sirotkin; TEPLOENERGETIKA, Dec 82).....	32
Turbine Machine Labyrinth Seal Geometric Parameter Optimization (M. S. Zharkoy; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ENERGETIKA, Feb 83).....	33
Planning of Turbine Stages With Tangential Slope of Variable Profile Guide Vanes (N. N. Afanas'eva, L. S. Pertsovskiy; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ENERGETIKA, Feb 83).....	33
Thermally Stressed State of PT-135/165-130/15 Turbine Rotor During Startup (V. L. Pokhoriler, et al.; ELEKTRICHESKIYE STANTSII, Mar 83).....	34
Study of Axial Forces in K-500-240-2 Turbine (L. P. Serezhina, et al.; ELEKTRICHESKIYE STANTSII, Mar 83).....	34
Development of Stages for High Temperature Gas Turbines (I. I. Kirillov, et al.; TEPLOENERGETIKA, Mar 83).....	35
Power Gas Turbine Compressor Characteristics (A. I. Mekhanikov, et al.; TEPLOENERGETIKA, Mar 83).....	35
Study of Cooled Channel Vanes in High Power Gas Turbines (L. V. Arsen'ev, et al.; TEPLOENERGETIKA, Mar 83).....	36
Limiting Conditions of Erosive Damage to Turbine Vane Trailing Edges in High Power Steam Turbines (A. P. Ogurtsov, et al.; TEPLOENERGETIKA, Mar 83).....	36
Influence of Flow Rotation on Axial Force on Turbine Wheel (A. S. Baybikov; TEPLOENERGETIKA, Feb 83).....	37
Calculation Estimate of Stress State and Cyclical Strength of K-300-240 KhIGZ Turbine Low and High Pressure Stages (V. I. Berlyand, et al.; TEPLOENERGETIKA, Feb 83).....	37
Extended Tests of Gas Turbine Plant on 'Kapitan Smirnov' Ship (V. V. Gartvig, et al.; SUDOSTROYENIYE, Jan 83).....	38

Temperature Fields of Turbogenerator Rotor With Superconductor Field Winding (I. A. Glebov, et al.; IZVESTIYA AKADEMII NAUK SSSR: ENERGETIKA I TRANSPORT, Sep-Oct 82).....	39
Method of Designing Long Turbine Blades (I. G. Gogolev, R. V. Kuz'michev; IZVESTIYA AKADEMII NAUK SSSR: ENERGETIKA I TRANSPORT, Nov-Dec 82).....	39
Extreme Noise of Operation of Axio-Radial Turbine Stages (I. I. Kirillov, et al.; IZVESTIYA AKADEMII NAUK SSSR: ENERGETIKA I TRANSPORT, Nov-Dec 82).....	40
Diffusers of Centrifugal Compressors With Two Rows of Asymmetrical Spaced Blades (S. A. Anisimov, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ENERGETIKA, Jan 83).....	41
Optimization of Basic Parameters of AES With Steam Turbines and Gas-Cooled Fast Reactor Taking Into Account Constraints on Gas Blowing Power (Ye. A. Larin, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ENERGETIKA, Jan 83).....	42
Behavior of Low-Pressure Component of District Heating Turbines During Operation With Minimum Steam Admission to Condenser (A. M. Leonkov, V. K. Balabanovich; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ENERGETIKA, Jan 83).....	42
Vortex Structures and Movement of Moisture Through Turbine (I. I. Kirillov, G. G. Shpenzer; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ENERGETIKA, Jan 83).....	43
Relation Between Aerodynamics in Combustion Chamber and Dynamics of Heat Release (V. T. Dudkin, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, Jul-Sep 82).....	44
Loss of Total Pressure in Diffusers in Mixing-Afterburning Chambers (A. Ya. Dantsyg, N. M. Petrov; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, Jul-Sep 82).....	44
Experimental Study of Annular Film-Vaporization Combustion Chamber for Low-Power Gas-Turbine Engine (V. N. Afrosimova, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, Jul-Sep 82).....	45

Selection of Optimum Output Parameters of Starter for Double-Shaft Two-Stage Turbojet Engine (V. G. Avgustinovich, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Jul-Sep 82).....	45
Determination of Range of Expedient Application for Microturbines With Reentry of Working Medium (N. T. Tikhonov, V. N. Matveyev; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Jul-Sep 82).....	46
Set of Criteria for Engine Interfacing and Efficiency Estimation in Preliminary Stage of Technical Evaluation (V. A. Sgilevskiy; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Jul-Sep 82).....	47
Mathematical Model for Upper-Level Automatic Design of Helicopter Gas-Turbine Engine With Optimum Regulation Program (A. V. Naumov; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Jul-Sep 82).....	47
Transient Processes of Combustion Surface Formation in Solid-Propellant Rocket Engine With Hydraulic Regulator (I. A. Krivosheyev, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Jul-Sep 82).....	48
Method of Calculating Parameters of Turbojet Engine for Windmilling Mode of Operation (V. I. Kuznetsov; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Jul-Sep 82).....	48
Statistical Estimation of Mean Operating Margin for Aircraft Engine Depending on Cause of Failure (A. Ya. Kuznetsov; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Jul-Sep 82).....	49
Estimation Technical State of Aircraft Gas-Turbine Engines From Thermogasdynamic Parameters With Natural Dispersion of State Parameters Taken Into Account (M. A. Kabeshov, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Jul-Sep 82).....	50
Improving Rotor Reliability on Feed Pump Motors in 300 MW Generator Facilities (Ye. K. Inozemtsev; ENERGETIK, Feb 83).....	50

NAVIGATION AND GUIDANCE SYSTEMS

- Study of Properties of System of Two-Stage Powered Gyroscopes
(V. N. Vasil'yev; IZVESTIYA AKADEMII NAUK SSSR:
MEKHANIKA TVERDOGO TELA, Sep-Oct 82)..... 52

- Analysis of High Order Digital Tracking Systems on Phase Plane
(A. A. Gordeyev, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH
ZAVEDENIY: PRIBOROSTROYENIYE, Feb 83)..... 53

HIGH-ENERGY DEVICES, OPTICS AND PHOTOGRAPHY

- Analysis of Output Signal From Devices Measuring Defocusing
of Lenses With Coherent Illumination
(G. M. Mosyagin; IZVESTIYA VYSSHIKH UCHEBNIKH
ZAVEDENIY: PRIBOROSTROYENIYE, Feb 83)..... 54

- Automation of Optical System Planning
(S. A. Rodionov; IZVESTIYA VYSSHIKH UCHEBNIKH
ZAVEDENIY: PRIBOROSTROYENIYE, Feb 83)..... 54

- Device for Manufacture of Large Thin Spherical Mirrors
(T. I. Isayev, I. A. Radkevich; PRIBORY I TEKHNIKA
EKSPERIMENTA, Jan-Feb 83)..... 55

- Nanosecond X-Ray Frame Image Converter Based on Microchannel
Plate
(L. Ye. Aranchuk, et al.; PRIBORY I TEKHNIKA
EKSPERIMENTA, Jan-Feb 83)..... 56

- Programmed Apparatus Adjustment Control Devices in Laser
Optical Systems
(A. P. Allin, et al.; PRIBORY I TEKHNIKA EKSPERIMENTA,
Jan-Feb 83)..... 56

- Shadow Installation To Study Transparent Optical
Heterogeneities Under Vibration Conditions
(A. N. Korolev, et al.; PRIBORY I TEKHNIKA
EKSPERIMENTA, Jan-Feb 83)..... 57

- Semiconductor Conversion Electron Spectrometer With 2-
Background Suppression
(I. N. Vishnevskiy, et al.; PRIBORY I TEKHNIKA
EKSPERIMENTA, Jan-Feb 83)..... 57

- Annihilation Photon Angular Distribution Analyzer Based on
Image Converter
(V. I. Zhavoronkov, et al.; PRIBORY I TEKHNIKA
EKSPERIMENTA, Jan-Feb 83)..... 58

Minimizing Current Losses in Electron Cyclotron Injection Section	
(V. N. Anosov, et al.; PRIBORY I TEKHNIKA EKSPERIMENTA, Jan-Feb 83).....	58
Heavy Ion Accelerator	
(Ye. I. Logachev, et al.; PRIBORY I TEKHNIKA EKSPERIMENTA, Jan-Feb 83).....	59
Change of Null Shift in Ring Laser Caused by Diffraction	
(Ye. D. Maslenok, D. K. Mynbayev; OPTIKA I SPEKTROSKOPIYA, Dec 82).....	59
Broadband Interference Filters	
(Yu. N. Markov, et al.; OPTIKA I SPEKTROSKOPIYA, Dec 83).....	60
Dependence of Beat Frequency in Ring Laser on Perturbations of Discharge Current	
(V. V. Tuchin, V. I. Chetverikov; OPTIKA I SPEKTROSKOPIYA, Dec 82).....	60
Scattering Indicatrices of Laser Mirrors	
(Ye. A. Petrukhin, S. A. Savranskiy; OPTIKA I SPEKTROSKOPIYA, Dec 82).....	61
Variant Facet-Type Reflector Design With Variable Geometry	
(Yu. K. Shcherbakov; GELIOTEKHNIKA, Jan-Feb 83).....	62
Tolerances on Parameters of Facet Elements in Concentrator Arrays	
(A. Sh. Khodzhayev, et al.; GELIOTEKHNIKA, Jan-Feb 83)...	63
Optical System for Heliostat Orientation	
(V. K. Baranov, V. Ye. Medvedev; GELIOTEKHNIKA, Jan-Feb 83).....	63
Photosensitivity of n^+p - p^+ Photovoltaic Cell Illuminated on the p - p^+ Side as Function of p^+ -Layer Parameters	
(Yu. A. Anoshin, et al.; GELIOTEKHNIKA, Jan-Feb 83).....	64
Universal Neutron Irradiator Based on ^{252}Cf	
(M. A. Bak, et al.; ATOMNAYA ENERGIYA, Feb 83).....	65
New Synchrotron Complex at Radium Institute Imeni V. G. Khlopin	
(N. A. Perfilov, et al.; ATOMNAYA ENERGIYA, Feb 83).....	65

FLUID MECHANICS

Physics of Separated Flow in End Zones of Turbine Blading (L. L. Chernyshev; ENERGOMASHINOSTROYENIYE, Jan 83).....	67
Asymptote of Orr-Sommerfeld Equation Solutions Defining Unstable Oscillations With Large Reynolds Numbers (V. I. Zhuk, O. S. Ryzhov; DOKLADY AKADEMII NAUK SSSR, Feb 83).....	68
Propagation of Shock Waves Through Liquid With Gas Bubbles (Z. A. Shikmurzayeva; VESTNIK MOSKOVSKOGO UNIVERSITETA, SERIYA 1: MATEMATIKA MEKHANIKA, Jan-Feb 82).....	68
Aerodynamic Characteristics of Delta Wing at Subsonic Flight Velocities (V. I. Voronin; VESTNIK MOSKOVSKOGO UNIVERSITETA, SERIYA 1: MATEMATIKA MEKHANIKA, Jan-Feb 82).....	69
Effect of Particles in Gaseous Suspension on Gas Parameters During Flow Around Blunt Body (I. Kh. Yenikeev; VESTNIK MOSKOVSKOGO UNIVERSITETA, SERIYA 1: MATEMATIKA MEKHANIKA, Jan-Feb 82).....	69
Processes of Filling Main Pipeline With Liquid (V. V. Berdnikov, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Jul-Sep 82).....	70
Transient Method of Studying Heat Transfer in Cooling Channels for Turbine Blades (K. M. Iskakov, V. A. Trushin; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Jul-Sep 82).....	71
Flow Pattern in Semiclosed Spaces of Stem Valves and Discharge Characteristics of Such Devices (V. N. Zaykovskiy, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Jul-Sep 82).....	71
Hydromechanical Design of Drainage System in Solar Heating Plant (Ty. K. Rashidov; GELIOTEKHNIKA, Jan-Feb 83).....	72
Relations for Design of Heat Exchanger Equipment in Solar Heating Plants (M. Ya. Poz, et al.; GELIOTEKHNIKA, Jan-Feb 83).....	73
Dependence of Efficiency of Thermoreceiver in Low-Temperature Solar Heater on Thermal Contact Resistance Between Shield and Heat Removing Channels (R. R. Avezov, N. A. Kakharov; GELIOTEKHNIKA, Jan-Feb 83).....	73

Sail Theory (M. A. Brutyan, P. L. Krapivskiy; DOKLADY AKADEMII NAUK SSSR, Jan 83).....	74
--	----

MECHANICS OF SOLIDS

Vibrations of Capacitor Plates Under Alternating Voltage (V. Ya. Shaforostov, L. G. Petrenko; ELEKTRICHESTVO, Nov 82).....	75
Electromagnetic Forces in Conical Radial Thrust Electromagnetic Bearing (Yu. N. Zhuravlev; ELEKTRICHESTVO, Nov 82).....	76
Reaction of Three-Layered Cylindrical Shell to Action of Non- Axisymmetric Moving Load (V. I. Pozhuyev; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Sep-Oct 82).....	77
Damping of Elastic Vibrations of Structures With Liquid (V. A. Buzhinskiy, G. N. Mikishev; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Sep-Oct 82).....	78
Stressed State of Rotating Ribbed Disk of Complex Configuration in Presence of Holes and Cracks (N. I. Volkov, L. A. Fil'shtinskiy; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Sep-Oct 82).....	79
Free Rotation of Aircraft as Rigid Body (A. I. Nelyubov; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Sep-Oct 82).....	79
Program Level of Control System for Walking Device When Moving at Assigned Speed (V. Ye. Berbyuk; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Sep-Oct 82).....	81
Maximum Capabilities of Elastoinertial Vibration Proofing (V. M. Ryabov; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Sep-Oct 82).....	81
Stability of Spinning of Rigid Body With Flexible Elements (L. V. Dokuchayev, O. P. Klishev; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Sep-Oct 82).....	82
Technological Considerations in Rational Selection of Setup Scheme and Processing Mode for Rough Grinding of Bodies of Revolution (V. S. Kamalov, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, Dec 82).....	83

Geometrical Dispersion and Damping of Waves in Laminate Composite Materials (N. A. Shul'ga, V. V. Levchenko; DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA A: FIZIKO-MATEMATICHESKIYE I TEKHNIЧЕСKIYE NAUKI, Dec 82).....	84
Synchronization Law for Unbalanced Vibration Exciters (I. I. Belkhman, O. G. Pirtskhalaishvili; SOOBShCHENIYA AKADEMII NAUK GRUZINSKOY SSR, Sep 82).....	85
Propagation of Longitudinal Elastic Waves Through Beam Surrounded by Winkler Medium (A. N. Filippov; VESTNIK MOSKOVSKOGO UNIVERSITETA, SERIYA 1: MATEMATIKA MEKHANIKA, Jan-Feb 82).....	85
Stressed-Strained State of Shell Structure With Viscoelastic Filler of Arbitrary Form (V. K. Bulgakov, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, Jul-Sep 82).....	86
Calculating Intersecting Cylindrical Shells Under Internal Pressure (Yu. A. Amenzade, et al.; DOKLADY AKADEMII NAUK AZERBAYDZHANSKOY SSR, Oct 82).....	87
Investigation of Influence That Configurational Parameters of Quadric Crank Mechanisms Have on Kinematic and Force Characteristics of Formed Six-Bar Linkages (R. P. Dzhevakhyan, A. I. Borisenko; IZVESTIYA AKADEMII NAUK ARMYANSKOY SSR: SERIYA TEKHNIЧЕСKIKH NAUK, Nov-Dec 82).....	87

TESTING AND MATERIALS

Method of Numerical Calculation of Temperature Fields of Complex Bodies (Ye. F. But'ko, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: PRIBOROSTROYENIYE, Feb 83).....	89
Experience in Vacuum Treatment of Precision Instrument Components (V. A. Pribylov; SUDOSTROYENIYE, Jan 83).....	90
Optimization of Optical and Thermophysical Properties of Coatings for Solar Batteries Without Self-Field (N. S. Lidorenko, et al.; GELIOTEKHNIKA, Jan-Feb 83).....	90
Rewinding Stators of Electric Machines With VES-2 Insulation (V. A. Guglin, Yu. E. Yuzhnyy; ENERGETIK, Feb 83).....	91

1 August 1983

USSR REPORT ENGINEERING AND EQUIPMENT

No. 96

CONTENTS

NUCLEAR ENERGY

Development Path of Fast Power Reactors With High Breeding Factor (S. B. Bobrov, et al.; ATOMNAYA ENERGIYA, Apr 83).....	1
Experimental Data on VVER-400 Reactor Neutron Fields (S. S. Lomakin , et al.; ATOMNAYA ENERGIYA, Mar 83).....	2
Procedural Questions Relating to Use of Nuclear Heat-and-Power Plants in USSR Unified Electric Power System and Fuel and Energy Complex (L. S. Khrilev, et al.; VESTSI AKADEMII NAVUK BSSR: SERYYA FIZIKA-ENERHETYCHNYKH NAVUK, 1982).....	2
Study of Structure of Nuclear Power System Providing Satisfaction of Demand for Electrical and Thermal Energy (V. L. Lokshin, VESTSI AKADEMII NAVUK BSSR: SERYYA FIZIKA-ENERHETYCHNYKH NAVUK, 1982).....	3
Study of Nuclear Power Plants With Fast Gas-Cooled Reactors (V. V. Lesnykh, et al.; VESTSI AKADEMII NAVUK BSSR: SERYYA FIZIKA-ENERHETYCHNYKH NAVUK, 1982).....	4
Methods of Studying Outlook for Various Types of Nuclear Power Plants in Expanding Nuclear Power System (V. I. Subbotin, et al.; VESTSI AKADEMII NAVUK BSSR: SERYYA FIZIKA-ENERHETYCHNYKH NAVUK, 1982).....	5
Procedure for Estimating Potential Role of Breeder in Energy of Future (V. S. Kagramanyan, V. B. Lytkin; VESTSI AKADEMII NAVUK BSSR: SERYYA FIZIKA-ENERHETYCHNYKH NAVUK, 1982).....	6

Analysis of Potential Capabilities of Alternative Breeders in Multicomponent Model of Nuclear Power System (V. G. Ilyunin, et al.; VESTSI AKADEMII NAVUK BSSR: SERYYA FIZIKA-ENERHETYCHNYKH NAVUK, 1982).....	8
Optimization Model of Development of Widescale Nuclear Power, Including Production of Electric Power and Heat (Yu. P. Yelagin; VESTSI AKADEMII NAVUK BSSR: SERYYA FIZIKA-ENERHETYCHNYKH NAVUK, 1982).....	9
Influence of System Factors on Development Trends and Key Parameters of Nuclear Power Plants (G. V. Levental, V. S. Kit; VESTSI AKADEMII NAVUK BSSR: SERYYA FIZIKA-ENERHETYCHNYKH NAVUK, 1982).....	10
Experience and Problems of Studying Nuclear Power Plants in Nuclear Power System and in Electric Power Systems (L. S. Popyrin; VESTSI AKADEMII NAVUK BSSR: SERYYA FIZIKA-ENERHETYCHNYKH NAVUK, 1982).....	11
NON-NUCLEAR ENERGY	
Design of Batteries With Solid Fillers (M. Ya. Poz, et al.; GELIOTEKHNIKA, Feb 83).....	13
Economic Analysis of Costs of Installation and Adjustment of Solar Power-Plant Heliostat Facets (R. A. Zakhidov, et al.; GELIOTEKHNIKA, Feb 83).....	13
Influence of Heat Exchange Factors on Results of Solar Power System Thermal Optimization (D. I. Teplyakov, R. R. Aparisi; GELIOTEKHNIKA, Feb 83).....	14
Experimental Study of Efficiency of Transparent Film Temperature Sensors Struck by Solar Radiation of Various Concentrations (Yu, Z. Mavashev, et al.; GELIOTEKHNIKA, Feb 83).....	14
Multisectional Flat Reflectors as Solar Radiation Concentrators (V. A. Grilikhes, O. F. Zaytsev; GELIOTEKHNIKA, Feb 83).....	15
Possibility of Accumulating Solar Radiation in Organic Photoisomers (S. N. Trushevskiy, et al.; GELIOTEKHNIKA, Feb 83).....	15
INDUSTRIAL TECHNOLOGY	
Method of Stipulating Structural Schemes of Manipulators (O. A. Filippov; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, Feb 83).....	16

Effectiveness of Using Adaptive Control Systems for Metal-Cutting Machine Tools (V. V. Dodonov; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE, Feb 83).....	16
Selection and Calculation of Basic Parameters of Tongs for Portal-Type Automatic Manipulators (B. A. Usov, A. A. Ignat'yev; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE, Feb 83).....	17
Optimized Synthesis of Guide Mechanism With Constraints on Contour Velocity in Template-Roller Pair (M. D. Blekhan, V. P. Polykhin; MASHINOVEDENIYE, Mar-Apr 83).....	18
Synthesis of Algorithm of Manipulator Motion Control According to Given Trajectory Based on Dynamic Model of Servomechanism (Ye. I. Vorob'yev, Ye. I., Ye. V. Pis'mennaya; MASHINOVEDENIYE, Mar-Apr 83).....	18
Computer Modeling of Hydraulic Drives With Inertialess Elements (S. A. Yermakov, A. V. Kudinov; MASHINOVEDENIYE, Mar-Apr 83).....	19
Main Results of Study Pertaining to Dynamics of Constant-Speed Pulse Mechanisms (V. G. Karaban', A. I. Skrebtsov; MASHINOVEDENIYE, Mar-Apr 83).....	20
Calculating Parameters of Adaptive Industrial Robot Image Converter Optical System (V. M. Komarov; IZVESTIYA VYSSHIKH ZAVEDENIY: PRIBOROSTROYENIYE, Mar 83).....	20
TURBINE AND ENGINE DESIGN	
Heat-Pipe Cooling Systems for Blades of Gas Turbine Engines (B. I. Komarov, et al.; IZVESTIYA UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE, Jan 83).....	22
Thermally Stressed State of Turbine Nozzle Vanes During Shutdown (A. V. Antonovich, et al.; PROBLEMY PROCHNOSTI, Feb 83).....	23
Production of Extra Power for District Heating Turbines (G. A. Shapiro; TEPLOENERGETIKA, Jan 83).....	23

Design Study of Variable Modes of Leningrad Metal Plant K-1000-60/3000 Turbine (A. Sh. Leyzerovich, et al.; TEPLOENERGETIKA, Jan 83).....	24
Vibrations of Blade Rims of Final Stages of Steam Turbine Under Unrated Operating Conditions (A. G. Kostyuk; TEPLOENERGETIKA, Jan 83).....	26
Experience of Using Saturated-Steam Turbines for Nuclear Power Plants (Yu. F. Kosyak, et al.; TEPLOENERGETIKA, Jan 83).....	27
Steam Turbines: Successes, Unsolved Problems (B. M. Troyanovskiy; TEPLOENERGETIKA, Jan 83).....	28
NAVIGATION AND GUIDANCE SYSTEMS	
Instability of Gyrocompass Under Variable Moments Acting on Wheel at Resonance (V. M. Vorob'yev; PRIKLADNAYA MEKHANIKA, Dec 82).....	29
Analysis of Force Characteristics of Cryogenic Gyroscope Suspension (V. F. Zhuravlev, V. M. Rudenko; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Jan-Feb 83).....	29
Equations of Motion of Gyropendulum Systems in Rodrigues-Hamilton Parameters (Yu. N. Chelnokov; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Mar-Apr 83).....	30
Possible Uses of Information on Constant Altitude in Inertial Navigation Systems (A. I. Matasov; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Mar-Apr 83).....	30
Influence of Dissipative Magnetic Moment on Rotation of Satellite Relative to Center of Mass (V. V. Sazonov, V. A. Sarychev; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Mar-Apr 83).....	31
Algorithms for Hardware Implementation of Ship Location Graphic Representation on Navigation Map Considering Terrestrial Asphericity (A. Ye. Borzenko, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PRIBOROSTROYENIYE, Mar 83).....	31
Error of Two-Axis Gyrostabilizer With Random Base Oscillations (A. M. Lestev, A. V. Romanova; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PRIBOROSTROYENIYE Mar 83).....	32

HIGH-ENERGY DEVICES, OPTICS AND PHOTOGRAPHY

Laser Technology: Experience and Prospects for Implementation (G. Abil'sitov; PLANOVYE KHOZYAYSTVO, May 82).....	33
Influence of Nozzle Profile on Gas Dynamic Laser Characteristics (V. I. Kireyev, et al.; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA ZHIDKOSTI I GAZA, Nov-Dec 82).....	45
Ellipsometric Study of Mechanically Polished Specimens of Certain Optical Glasses (V. P. Maslov, V. A. Odarich; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Mar 83).....	46
Interference Optical Filter Based on Liquid Crystal (V. I. Maksimov, A. N. Gopko; OPTIKO- MEKHANICHESKAYA PROMYSHLENNOST', Mar 83).....	46
Change in Polarization Status of Diverging Light Beam in Reflecting Prism (N. F. Maksimova; OPTIKO-MEKHANICHESKIY PROMYSHLENNOST', Mar 83).....	47
Use of Lens Compensator to Test Wide-Aperture Hyperbolic Surface (I. Ya. Bubis, et al.; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Mar 83).....	47
Progressive Method of Producing Lens Type Optical Part Blanks (S. K. Shtandel', et al.; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Mar 83).....	48
Series Manufacture of Convex Aspherical Condenser Lenses (A. F. Roshak, et al.; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Mar 83).....	48
Electron Beam Installation for Welding Thinwall Bodies (L. Yu. Vol'fson, et al.; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Mar 83).....	49
Control of Process of Adjustment of Optical Lines of Multichannel Laser Installations (V. M. Stakh, G. S. Gavrilova; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Mar 83).....	49
Influence of Metal Surface Optical Property Heterogeneity on Reflectometer Indications (Yu. V. Ashkerov, et al.; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Mar 83).....	50

Material Parameters Determining Surface Accuracy of Large Astronomical Mirrors (G. I. Amur; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', Mar 83).....	50
Selection of Equatorial Star Coordinates Based on Computer Printouts to Calculate Azimuths (M. A. Sergeyev, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PRIBOROSTROYENIYE, Mar 83).....	51
Production of Pure Beams of Nuclei in the JINR Synchrophasotron (Yu. D. Beznogikh, et al.; ATOMNAYA ENERGIYA, Mar 83).....	51

FLUID MECHANICS

Steady Rotation of Arbitrary Axisymmetric Body in Boundless Viscoplastic Medium (Yu. Ya. Kolobovskiy; PRIKLADNAYA MEKHANIKA, Feb 83).....	53
Quasi-Static Loss of Stability by Rotating Cylindrical Shell With Fluid (Yu. I. Badrukhin, et al.; PRIKLADNAYA MEKHANIKA, Feb 83)....	53
Dynamics of Soft Braking Systems (S. M. Belotserkovskiy, et al.; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Jan-Feb 83).....	54
Kinematic Control of Movement of Vessel With Ideal Heavy Fluid (L. D. Akulenko; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Jan-Feb 83).....	55
Movement of Circular Cylinder in Rectangular Channel (A. N. Vasil'ev, V. V. Galubev; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA ZHIDKOSTI I GAZA, Jan-Feb 83).....	55
System of Developed Cavitation Flow Around Wedge (M. T. Bekulov; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA ZHIDKOSTI I GAZA, Jan-Feb 83).....	55
Supersonic Flow Around a Thin Code With Nonaxisymmetric Nodes (S. L. Vishnevetskiy, M. A. Ivanov; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA ZHIDKOSTI I GAZA, Jan-Feb 83).....	56
Problem of Modeling of Hypersonic Flow Around Bodies in Wind Tunnels (V. I. Alferov, O. N. Vitkovskaya; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA ZHIDKOSTI I GAZA, Jan-Feb 83)	

Profiling of Axisymmetric and Flat Nozzles Producing a Radial Supersonic Flow (A. N. Krayko, V. V. Shelomovskiy; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA ZHIDKOSTI I GAZA, Jan-Feb 83).....	57
Body of Minimal Wave Resistance in a Twisted Hypersonic Flow (N. A. Ostapenko; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA ZHIDKOSTI I GAZA, Jan-Feb 83).....	57
Theoretical and Experimental Study of Viscous Fluid Flow Near Line of Intersection of Cylindrical and Flat Surfaces (Yu. G. Gurevich; IZVESTIYA AKADEMII NAUK SSSR: MAKHANIKAZHIDKOSTI I GAZA, Jan-Feb 83).....	58
Spatial Supersonic Flow of an Ideal Gas Around a Finned Body (A. V. Rozin; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKAZHIDKOSTI I GAZA, Jan-Feb 83).....	58
Penetration of Jet Blown Through Convex Cylindrical Surface Into Supersonic Flow (V. F. Zakharchenko, et al.; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKAZHIDKOSTI I GAZA, Jan-Feb 83).....	59
Exact Solution of Problem of Gas Compression By Spherical Shell (A. M. Svalov; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKAZHIDKOSTI I GAZA, Nov-Dec 82).....	59
Configuration of Subsonic Zones Arising Upon Supersonic Flow Around a Spherically Blunted Cylinder at High Angles of Attack (V. B. Minostsev, K. G. Savinov; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKAZHIDKOSTI I GAZA, Nov-Dec 82).....	60
Distant Nonlinear Field With Transsonic Flow Around a Nonload-Bearing Profile (G. D. Sevost'yanov; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKAZHIDKOSTI I GAZA, Nov-Dec 82).....	60
Approximate Solution of Non-Self-Similar Problem of Movement of Piston After Brief Impact (M. D. Ustinov; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKAZHIDKOSTI I GAZA, Nov-Dec 82).....	61
Calculation of Three-Dimensional Transsonic Gas Flow Through Axial Turbine Stage (V. I. Gnesin; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKAZHIDKOSTI I GAZA, Nov-Dec 82).....	61

Radiation of Internal Waves Upon Rapid Horizontal Motion of Cylinders and Spheres (V. A. Gorodtsov, E. V. Teodorovich; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA ZHIDKOSTI I GAZA, Nov-Dec 82).....	62
Stream Flow of an Ideal Fluid Around a Flexible Shell (V. P. Zhitnikov, A. G. Terent'ev; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA ZHIDKOSTI I GAZA, Nov-Dec 82).....	62
Approximate Calculation of Aerodynamic Characteristics of Short Cylindrical Body in Incompressible Flow (A. I. Pastukhov, A. D. Deryabin; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Oct-Dec 82).....	63
Critical Flutter Speed of Fin With Rudder (V. A. Pavlov, S. K. Chernikov; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Oct-Dec 82).....	63
MECHANICS OF SOLIDS	
Stability Analysis of Automatic Balancer (M. V. Zakrzhevskiy, F. I. Turonok; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, Feb 83).....	64
Axisymmetric Harmonic Vibrations of Piezoceramic Shells of Revolution (V. I. Gololobov; PRIKLADNAYA MEKHANIKA, Dec 82).....	65
Interaction of Plane Steady Acoustic Wave and Cylindrical Shell Hinge-Mounted on Stiff Half-Space (A. S. Ovsyannikov; PRIKLADNAYA MEKHANIKA, Dec 82).....	65
Optimization of Reinforced Cylindrical Shells for Carrying Local Loads on Basis of Strength Criterion (V. P. Maksimenko; PRIKLADNAYA MEKHANIKA, Dec 82).....	66
Stressed-Strained State of Pressure Tank Made of Composite Material With Elastic Interlayer Between Shell and Flange (V. A. Nikityuk; PRIKLADNAYA MEKHANIKA, Dec 82).....	66
Axisymmetric Stressed State of Nearly Spherical Thick-Walled Elastic Shells (Yu. N. Nemish, et al.; PRIKLADNAYA MEKHANIKA, Dec 82).....	67

Elastoplastic State of Solids of Revolution Under Variable Nonisothermal Loading With Creep (V. G. Savchenko; PRIKLADNAYA MEKHANIKA, Dec 82).....	68
Parametric Vibrations of Rotor Mounted in Ball Bearings (A. N. Burmistrov, M. A. Galakhov; MASHINOVEDENIYE, Mar-Apr 83).....	68
Solution of Transient Problem of Lubrication in Conical Hydrostatodynamic Bearings (I. Ya. Tokar', R. Z. Khaysarov; MASHINOVEDENIYE, Mar-Apr 83).....	69
Natural Vibrations of Multispan Regular Girders of Shells-of-Revolution Type (O. V. Gromyko, A. Yu. Popov; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, Jan 83)....	70
Parametric Vibrations of Straight Hoses (A. N. Balakirev, I. S. Saginadze; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, Jan 83)....	70
Parametric Vibrations of Bearing Housing and Shaft (V. M. Starzhinskiy, L. M. Kvartin; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, Jan 83).....	71
Load Capacity of Cylindrical Shell Under Pure Bending (A. M. Lokoshchenko, N. Ye. Pechenina; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, Jan 83).....	72
Elastoplastic Equilibrium of Thick-Walled Hollow Cylinder Made of Nonhomogeneous Material (V. I. Zndreyev, Ye. Ye. Shipilova; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, Jan 83)....	72
Identification of Stiffness of Shaft Supports in Bearing Assemblies (V. A. Kudinov, et al.; MASHINOVEDENIYE, Mar-Apr 83).....	73
Vibroshock Resonances in Systems With Random Parametric Perturbation (A. S. Kovaleva; MASHINOVEDENIYE, Mar-Apr 83).....	74
Effect of High-Frequency Vibration on Processes of Plastic Deformation (V. K. Astashev; MASHINOVEDENIYE, Mar-Apr 83).....	74
Circumferential Propagation of Harmonic Waves in Piezoceramic Shells of Revolution (V. I. Gololobov, I. B. Polovinkina; PRIKLADNAYA MEKHANIKA, Jan 83).....	75

Thermally Stressed State of Bodies of Paraboloidal Shape and Finite Dimensions (V. I. Skripka; PRIKLADNAYA MEKHANIKA, Jan 83).....	76
Nonlinear Vibrations of Slightly Asymmetric Elastic Systems With Many Degrees of Freedom L. N. Pokrovskiy; PRIKLADNAYA MEKHANIKA, Jan 83).....	76
Buckling of Beam Under Compression and Torsion Beyond Elastic Limit (V. S. Davydov; PRIKLADNAYA MEKHANIKA, Jan 83).....	77
Dynamics of Vibration-Isolated Foundations Under Machines and Other Equipment (V. A. Ivovich; PRIKLADNAYA MEKANIKA, Jan 83).....	77
Stressed State of Double-Layer Cylindrical Shell Resulting From Assembly of Component Shells With Deviations From Circular Shape (B. P. Chernov; PRIKLADNAYA MEKHANIKA, Jan 83).....	78
Ultimate Concentrated Load Applied to Shell at Arbitrary Point (A. S. Dekhtyar', L. B. Kotova; PRIKLADNAYA MEKHANIKA, Jan 83).....	79
Elastoplastic State of Laminate-Wound Cylindrical Shell Under Internal Pressure (L. A. Il'in, N. A. Lobkova; PRIKLADNAYA MEKHANIKA, Jan 83)..	79
Stability of Reinforced Thin Conical Shells (G. D. Gavrilenko; PRIKLADNAYA MEKHANIKA, Jan 83).....	80
Numerical Solution of Axisymmetric Problems in Dynamics of Thin Orthotropic Shells of Revolution (A. Kh. Valiullin; PRIKLADNAYA MEKHANIKA, Jan 83).....	80
Behavior of Shells of Revolution During Axisymmetric Deformation (V. V. Pikul'; PRIKLADNAYA MEKHANIKA, Jan 83).....	81
Stability of Flexible Shallow Shells in Temperature Field (L. F. Vakhlayeva, V. A. Krys'ko; PRIKLADNAYA MEKHANIKA, Jan 83).....	81
Linear Theory of Thin Shells on Basis of 'Associated Vectors' Concept (Ya. F. Kayuk; PRIKLADNAYA MEKHANIKA, Jan 83).....	82
Load Capacity of Beam Structures Made of Materials With Limited Plasticity (V. Ya. Bachinskiy, Ye. S. Maniskevich: prikladnaya Mekhanika. Feb 83).....	82

'Periodic' Solution of Elasticity Problem for Axisymmetric Deformable Elastic Paraboloid of Revolution (V. I. Skripka; PRIKLADNAYA MEKHANIKA, Feb 83).....	83
Forced Vibrations of Cylindrical Shell in Acoustic Wedge (M. A. Potapov, N. A. Shul'ga; PRIKLADNAYA MEKHANIKA, Feb 83).....	83
Variational Equations of Thermodiffusion in Deformable Thin Shells With Finite Stiffness in Shear (R. N. Shvets, M. S. Ravrik; PRIKLADNAYA MEKHANIKA, Feb 83).....	84
Experimental Study of Stability of Reinforced Spherical Shells Under External Pressure (O. A. Grachev, A. S. Pal'chevskiy; PRIKLADNAYA MEKHANIKA, Feb 83).....	85
Nonaxisymmetric Buckling of Deep Elastic Shells of Revolution (I. M. Bermus, L. S. Srubshchik; PRIKLADNAYA MEKHANIKA, Feb 83).....	85
Method of Discrete Approximation of Functional in Stability Problems for Shells of Revolution (D. B. Babich; PRIKLADNAYA MEKHANIKA, Feb 83).....	86
Free Vibrations of Prestressed Cylindrical Shell of Variable Thickness (S. N. Kukudzhinov; PRIKLADNAYA MEKHANIKA, Feb 83).....	87
Free Vibrations of Reinforced Cylindrical Shell With Perfectly Solid Body on Intermediate Supports (V. G. Palamarchuk; PRIKLADNAYA MEKHANIKA, Feb 83).....	87
Application of Chebyshev Polynomials to Problems of Interaction Between Thick-Walled Elastic Sphere and Acoustic Medium (V. A. Galazyuk, A. N. Gorechko; PRIKLADNAYA MEKHANIKA, Feb 83).....	88
Stress-Strain State of Orthotropic Multilayer Shells (A. N. Ul'yashina; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Jan-Feb 83).....	89
Geometric Theory of Shell Stability (A. L. Gol'denveyzer; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Jan-Feb 83).....	89

Optimum Design of Rigid Plastic Beams With Stepwise Constant Height Under Pulsed Loading (Yu. R. Lepik; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Jan-Feb 82).....	90
Solution of Singular Problems of Twisting Elastic-Ideally Plastic Rod (A. M. Protsenko; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Jan-Feb 83).....	90
Optimal Shape of Reinforced Column Growing at Random Speed (V. B. Kolmanovskiy, V. V. Metlov; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Jan-Feb 83).....	91
Stress State of Porous Fluid-Saturated Half Space With External Distributed Pressure (A. F. Zazovskiy; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Mar-Apr 83).....	91
Contact Problems of Discrete Interaction of Plate and Rod (L. S. Rybakov; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Mar-Apr 83).....	92
Natural Oscillations of Inhomogeneous Viscoelastic Bodies (V. P. Maiborda, I. Ye. Troyanovskiy; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Mar-Apr 83)....	92
Behavior of Solutions of Dynamic Problems at Edge of Crack Moving With Transsonic Velocity in Elastic Medium (I. V. Simonov; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Mar-Apr 83).....	93
Flight Simulation Algorithm for Dynamic Support-Type Test Stand (V. V. Aleksandrov, et al.; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Mar-Apr 83).....	93
Problem of Determining Load-Bearing Capacity of Glass Reinforced Plastic Aircraft Propellor Blade (G. P. Zaytsev, S. A. Silant'yev; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Oct-Dec 82).....	94
Stability Calculation of Spherical Imperfect Shell Based on Refined Bulging Pattern (A. G. Teregulov; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Oct-Dec 82).....	94

Oscillations of Smooth Shell With Attached Mass Distributed Over Part of Surface (B. A. Antuf'yev; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, Oct-Dec 82).....	95
Calculation of Stresses on Surface of Elastic Body (V. Ya. Adlutskiy; PROBLEMY PROCHNOSTI, Feb 83).....	95
Technology of Manufacture and Strength Computation of Cylindrical Equal Strength Composite Shells Obtained by Diffusion Saturation (T. N. Martynova, M. I. Chayevskiy; PROBLEMY PROCHNOSTI, Feb 83).....	95
Load-Bearing Capacity of Metal Shells With Soft Sectors (L. S. Gol'braykh, et al.; PROBLEMY PROCHNOSTI, Feb 83).....	96
Nonuniform Loading of Shells by Ponderomotive Forces (L. V. Andreyev, et al.; PROBLEMY PROCHNOSTI, Feb 83).....	97
TESTING AND MATERIALS	
Problem of Thermal Failure With Rapid Heating (S. A. Shesterikov, M. A. Yumasheva; IZVESTIYA AKADEMII NAUK SSSR: MEKHANIKA TVERDOGO TELA, Jan-Feb 83).....	98
Development and Study of Thermally Stable Diffusion- Reflecting Coatings (A. Ismanzhanov, et al.; GELIOTEKHNIKA, Feb 83).....	98
Scanning Polarization Photometry -- New Method for Determining Characteristics of Topologic Structures in Microelectronics (A. A. Danilov; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST' Mar 83).....	99

6 October 1983

USSR REPORT ENGINEERING AND EQUIPMENT

No. 97

CONTENTS

SURFACE TRANSPORTATION

- Energy Characteristics of Linear Synchronous Motor With
Active Roadbed Crossing Joints Between Energized Segments
(V. A. Vinokurov, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH
ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NIY VYPUSK,
No 2, Feb 83)..... 1
- Basic Parameters of Electromagnetic Suspension for High-Speed
Ground-Transportation Vehicles
(Valdis Yanovich Auza, Nikolay Nikolayevich Ustinov;
IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY:
ELEKTROMEKHANIKA: SPETSIAL'NIY VYPUSK, No 2, Feb 83).... 2
- Control of Multipivot Electromagnetic Suspension
(N. O. Devyatova, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH
ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NIY VYPUSK,
No 2, Feb 83)..... 2
- Pulse Regulation of Three-Phase Rectifier Banks
(Valentin Mikhaylovich Antyukhin, et al.; IZVESTIYA
VYSSHIKH UCHEBNIKH ZAVEDENIY: ELEKTROMEKHANIKA:
SPETSIAL'NIY VYPUSK, No 2, Feb 83)..... 3
- Energy Characteristics of Train Motion and Electric Power
Supply for High-Speed Ground Transportation
(German Parmenovich Dolaberidze, Viktor Pavlovich
Stroyev; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY:
ELEKTROMEKHANIKA: SPETSIAL'NIY VYPUSK, No 2, Feb 83).... 4
- Dynamics of High-Speed Ground-Transportation Vehicle on
Electromagnetic Suspension
(Mikhail Leonidovich Korotenko, et al.; IZVESTIYA
VYSSHIKH UCHEBNIKH ZAVEDENIY: ELEKTROMEKHANIKA:
SPETSIAL'NIY VYPUSK, No 2, Feb 83)..... 5

Optimization of Chassis Design for High-Speed Ground-Transportation Vehicles (Yevgeniy Nikolayevich Zhuravlev; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NIY VYPUSK, No 2, Feb 83).....	6
Theoretical and Experimental Handling of Problems of Dynamics in Design of Mechanical Part of High-Speed Ground-Transportation System (Oyar Petrovich Grapis, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NIY VYPUSK, No 2, Feb 83).....	7
Method and Equipment for Experimental Study of Interaction of Vehicle Model and Roadbed in High-Speed Ground-Transportation System (Yuriy Viktorovich Galashev, Aleksandr Yulianovich Murzenko; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NIY VYPUSK, No 2, Feb 83)....	8
Design of Proving Ground for Model of 40-Ton High-Speed Ground-Transportation Vehicle: Variants of Trestle Design (Yulian Nikolayevich Murzenko, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: ELEKTROMEKHANIKA SPETSIAL'NIY VYPUSK, No 2, Feb 83).....	9
Selection of Contact Pairs for Current Pickup in High-Speed Ground-Transportation (Yuriy Nikolayevich Shcherba, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NIY VYPUSK, No 2, Feb 83).....	10
Comparative Evaluation of Electric Power Supplies and Converter Equipment for High-Speed Ground-Transportation Vehicles With Linear Motors on Basis of Normalized Costs (Kapitolina Nikolayevna Suslova; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: ELEKTROMEKHANIKA SPETSIAL'NIY VYPUSK, No 2, Feb 83).....	11
Selecting Efficacious Configuration and Physical Parameters of Servomechanism Power Electromagnets for High-Speed Ground-Transportation Vehicles (Vladimir Il'ich Serebryakov, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NIY VYPUSK, No 2, Feb 83).....	11
Experimental Studies of Control System for Electromagnetic Suspension and of Horizontal Stabilization for 3-Ton Mockup Vehicle (Yuriy Aleksandrovich Nikitenko, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NIY VYPUSK, No 2, Feb 83).....	12

Model of Linear Synchronous Inductor Motors (Vasiliy Ivanovich Bocharov, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NYY VYPUSK, No 2, Feb 83).....	13
Effect of Higher Harmonics in Inductor Current on Distribution of Electromagnetic and Mechanical Loads in Linear Induction Motor (Ivan Ivanovich Tal'ya, Ol'ga Ivanovna Morozova; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NYY VYPUSK, No 2, Feb 83)....	14
Analytical Calculation of Electromagnetic Process and Mechanical Forces in Attraction-Type Suspension Systems (Oleg Valentinovich Tozoni, Mikhail Andreyevich Primin; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NYY VYPUSK, No 2, Feb 83)....	15
Levitational Figure of Merit for Electrodynamic Suspension Systems With Continuous Track Structure (Valeriy Mikhaylovich Kochetkov; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NYY VYPUSK, No 2, Feb 83).....	16
Engineering Method of Calculating Levitation Characteristics of Electrodynamic Suspension Systems (Sergey Vladimirovich Vasil'yev, Anatoliy Ivanovich Kiyenko; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NYY VYPUSK, No 2, Feb 83)....	16
Experimental Study of Counteracting Forces on Model of Electrodynamic Suspension (Eleonora Gennadiyevna Vladimirova, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NYY VYPUSK, No 2, Feb 83).....	17
Laboratory Test Stand for Experimental Study of Characteristics of Electrodynamic Suspension (Yevgeniy Fedorovich Makarov, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NYY VYPUSK, No 2, Feb 83).....	18
Evaluation of Energy Losses in Superconducting Magnets Designed for Suspension of High-Speed Ground- Transportation Vehicles (Yelena Borisovna Belopol'skaya, Ivan Dmitriyevich Lupkin; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NYY VYPUSK, No 2, Feb 83)....	19

Characteristics of Synchronous Propulsion and Guidance System for High Speed Ground-Transportation Vehicles (Sergey Vladimirovich Drozdov, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: ELEKTROMEKHANIKA: SPETSIAL'NYY VYPUSK, No 2, Feb 83).....	20
--	----

NUCLEAR ENERGY

Calculation of Optimal Energy Distribution in a Reactor (A. M. Afans'ev; ATOMNAYA ENERGIYA, No 5, May 83).....	21
Measurements of Reactivity of Nuclear Reactors (V. A. Kachalin, V. N. Pridachin; ATOMNAYA ENERGIYA, No 5, May 83).....	21
Estimate of Accumulation of ^{232}U Upon Cyclic Utilization of Fuel in the VVER-400 Reactor (T. S. Zaritskaya, et al.; ATOMNAYA ENERGIYA, No 5, May 83).....	22
Meteorologic Aspects of Selection of Areas for Nuclear Powerplants (N. Ye. Artemova; ATOMNAYA ENERGIYA, No 5, May 83).....	22

NAVIGATION AND GUIDANCE SYSTEMS

Movement of a Gyrostat by Inertia Around a Nonmoving Center of Mass (S. I. Zlochevskiy, G. M. Zharkov; VESTNIK MOSKOVSKOGO UNIVERSITETA: SERIYA I MATEMATIKA MEKHANIKA, No 3, May-Jun 83).....	24
--	----

HIGH-ENERGY DEVICES, OPTICS AND PHOTOGRAPHY

Relationship of Internal Laser Parameters With Passive Q-Switching to Output Radiation Characteristics (L. B. Vatova, V. S. Solov'ev; IZMERITAL'NAYA TEKHNIKA, No 11, Nov 82).....	25
Measurement of Pulsed Laser Radiation Divergence by Focal Spot Method With Mirror Wedge (Yu. M. Abrosimov, et al.; IZMERITEL'NAYA TEKHNIKA, No 11, Nov 82).....	25

FLUID MECHANICS

Calculation of Flow Around Rectangular Wings and Their Combinations in Subsonic Flow Based on Discrete Vortex Scheme (N. F. Vorb'ev, G. N. Shashkina; ZHURNAL PRIKLADNOY MEKHANIKI I TEKHNIЧЕСКОY FIZIKI, No 2, Mar-Apr 83).....	27
--	----

Pressure Pulsation Upon Flow Around Blunt Bodies (A. I. Shvets; ZHURNAL PRIKLADNOY MEKHANIKI I TEKHNICHESKOY FIZIKI, No 2, Mar-Apr 83).....	27
Unsteady Flow of Gas Into a Vacuum Through a Perforated Barrier (L. G. Miller; ZHURNAL PRIKLADNOY MEKHANIKI I TEKHNICHESKOY FIZIKI, No 2, Mar-Apr 83).....	28
Piercing of Ponderable Liquid Containing Bubbles by Thin Cone (S. G. Avagyan; IZVESTIYA AKADEMII NAUK ARMYANSKOY SSR: MEKHANIKA, No 1, Jan 83).....	28

MECHANICS OF SOLIDS

Problem of Excitation of Elastic Waves in a Half Space Containing a Horizontal Elastic Cylindrical Inclusion (M. G. Seleznev, T. N. Selezneva; ZHURNAL PRIKLADNOY MEKHANIKI I TEKHNICHESKOY FIZIKI, No 2, Mar-Apr 83).....	30
Stability of Thin Smoothly Curved Shells of Negative Gaussian Curvature (V. M. Yermolenko, V. M. Kornev; ZHURNAL PRIKLADNOY MEKHANIKI I TEKHNICHESKOY FIZIKI, No 2, Mar-Apr 83).....	30
Numerically Asymptotic Solution of Problem of Strength and Oscillations of Thin Shells of Revolution (V. S. Stepanenko; ZHURNAL PRIKLADNOY MEKHANIKI I TEKHNICHESKOY FIZIKI, No 2, Mar-Apr 83).....	31
Energy Loss to Plastic Deformation Upon Radial Compression of Cylindrical Shell (V. G. Belan, et al.; ZHURNAL PRIKLADNOY MEKHANIKI I TEKHNICHESKOY FIZIKI, No 2, Mar-Apr 83).....	31
Mechanical Paradoxes Involving Vibrations (V. N. Chelomey; DOKLADY AKADEMII NAUK SSSR, No 1, May 83).....	32
Method of Orthogonal Polynomials for Solving Problems of Forced Vibrations of Cylindrical Shells in Acoustic Medium (V. M. Aleksandrov, G. P. Strel'nikov; IZVESTIYA AKADEMII NAUK ARMYANSKOY SSR: MEKHANIKA, No 1, Jan 83).....	33
Conditions for Existence of Two Cranks in Three-Dimensional Five-Link Hinge Mechanisms (N. S. Davitashvili, M. L. Tsotadze; SOOBASHCHENIYA AKADEMII NAUK, GRUZINSKOY SSR, No 1, Jan 83).....	33

Description of Servomechanism Dynamics in Automatic Manipulator Taking Into Account Elasticity of Links (D. D. Tavkhelidze, T. F. Mchedlishvili; SOOBASHCHENIYA AKADEMII NAUK GRUZINSKOY SSR, No 1, Jan 83).....	34
---	----

TESTING AND MATERIALS

Absolute Radiant Heat Flux Receiver (I. M. Baskin, L. Ya. Paderin; IZMERITEL'NAYA TEKHNICA, No 11, Nov 82).....	35
Ultrasonic Gas Discharge Plasma Temperature Meter (P.-B. P. Milyus, et al.; IZMERITEL'NAYA TEKHNICA, No 11, Nov 82).....	35

9 November 1983

USSR REPORT
ENGINEERING AND EQUIPMENT

No. 98

CONTENTS

SURFACE TRANSPORTATION

- Interaction of Reticular Shell of Wheel and Ground Surface
(V. P. Grushin, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH
ZAVEDENIY: MASHINOSTROYENIYE, No 6, Jun 83)..... 1

MARINE AND SHIPBUILDING

- Transverse Vibrations of Shaftline on Board of Ship
(A. S. Kel'zon, et al.; DOKLADY AKADEMII NAUK SSSR,
No 6, Jun 83)..... 2
- Unipolar Superconducting Machines for Marine Electromotive
Systems
(Yu. F. Antonov, et al.; ENERGETIKA I TRANSPORT, No 1,
Jan-Feb 83)..... 3

NUCLEAR ENERGY

- Autonomous Maneuverable Low-Power Atomic Central Heating and
Electric Power Plant With Heat Storage
(M. Ye. Voronkov, et al.; ATOMNAYA ENERGIYA, No 1,
Jul 83)..... 4
- Technical and Economic Prerequisites for Construction of
Special-Purpose Atomic Central Heating and Electric Power Plant
(B. B. Baturov, et al.; ATOMNAYA ENERGIYA, No 1, Jul 83).. 5
- Physical Characteristics of BN-600 Fast Reactors
(Yu. A. Kazanskiy, et al.; ATOMNAYA ENERGIYA, No 1,
Jul 83)..... 6

Current Construction and Installation of Atomic Electric Power Plants With VVER-1000 Water-Moderated Water-Cooled Power Reactors (I. L. Sapir; ATOMNAYA ENERGIYA, No 1, Jul 83).....	7
Standards for Water Conditions in Horizontal Steam Generators of VVER Nuclear Powerplants (T. Kh. Margulova, et al.; TEPLOENERGETIKA, No 6, Jun 83)..	8
Maneuverability of VVER Reactor Installations (N. I. Yermakov, G. I. Biryukov; TEPLOENERGETIKA, No 6, Jun 83).....	8

NON-NUCLEAR ENERGY

Heat Losses in Hollow Solar Radiation Receiver (L. V. Avdeyeva, et al.; GELIOTEKHNIKA, No 3, May-Jun 83)..	10
Tests Performed on Solar Radiation Receiver for Solar Gas-Turbine Plant at Reynolds Number 1500-4000 (L. M. Drabkin, P. U. Khatamov; GELIOTEKHNIKA, No 3, May-Jun 83).....	11
Experimental Study of Plane Solar Radiation Collector (S. A. Azimov, et al.; GELIOTEKHNIKA, No 3, May-Jun 83)...	11
Study of "High" Pressure Air System for Conversion of Hydraulic Units to Synchronous Compensator Mode (A. M. Smirnov; GIDROTEKHNIЧЕСКОЕ СТРОИТЕЛ'СТВО, No 3, Mar 83).....	12
Hydrogenerators With Removable Rotor Casing (B. N. Vasil'ev, et al.; GIDROTEKHNIЧЕСКОЕ СТРОИТЕЛ'СТВО, No 5, May 83).....	13
Modeling of Thermohydraulic Processes in Rotating Cryostats of Cryoturbine Generators (Yu. L. Rybin, et al.; ENERGETIKA I TRANSPORT, No 1, Jan-Feb 83).....	13

INDUSTRIAL TECHNOLOGY

Analysis of Requirements Placed on D.C. Electromechanical Components of Industrial Robots (V. M. Kazanskiy, et al.; ELEKTRICHESTVO, No 2, Feb 83)...	14
Design of Sectional Grinding Wheels (V. G. Gusev, B. A. Serov; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, No 5, May 83).....	15

Characteristics of Vertical Gas Bearings With Profiled Shaft or Bushing Surface (V. S. Karpov, O. N. Tikhonenkova; MASHINOVEDENIYE, No 4, Jul-Aug 83).....	15
Coupled Movements of Robot With Two Degrees of Freedom and One Energy Source of Limited Power (V. V. Lunev; MASHINOVEDENIYE, No 4, Jul-Aug 83).....	16
Grinding Aspherical Optics in Modernized 'Start-500' Machine Tool With Computerized Control (L. V. Tevelev, B. V. Tyuterev; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', No 6, Jun 83).....	17
Selection of Route for Machining External Surfaces on Multispindle Automatic Machine Tools (O. Yu. Volkov, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, No 4, Apr 83).....	17
Fundamentals of Kinematics and Dynamics of Process of Ultrasonic External Honing (A. I. Markov, P. A. Yermak; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, No 4, Apr 83)....	18
Kinematic Analysis of New Wave-Type Step-by-Step Mechanism (A. I. Dobrolyubov, V. I. Zinkevich; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, No 4, Apr 83)....	19
Features of Technological Assurance for Use of Robotized Complex (S. F. Sobolev; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PRIBOROSTROYENIYE, No 6, Jun 83).....,.....	20
Effectiveness of Diamond Buffing of Parts for Gas-Turbine Engines (V. K. Yatsenko; PROBLEMY PROCHNOSTI, No 6, Jun 83).....	21
TURBINE AND ENGINE DESIGN	
Experimental Study of Low-Power Stirling Engine (M. A. Markman, et al.; GELIOTEKHNIKA, No 3, May-Jun 83)...	22
Theoretical Evaluation of Effect of Rotation on Natural Frequencies of Turbine Runners (V. P. Ivanov, A. I. Yermakov; PROBLEMY PROCHNOSTI, No 6, Jun 83).....	23
More Complete Fuel Combustion in Air Heating Chamber With Use of Prevaporized Fuel (N. A. Malishevskaya, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATSIONNAYA TEKHNKA, No 1, Jan-Mar 83).....	23

- Thermal State of Porous Turbine Blades in Straight Nozzle Array
(V. M. Yepifanov, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH
ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, No 1, Jan-Mar 83)..... 24
- Experimental Study of Model of Turbofan-Engine Exhaust Device
in Reverse-Thrust Mode
(Ye. V. Davydov, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH
ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, No 1, Jan-Mar 83)..... 24
- Experimental Study of Ball Bearings Combined With Hydrostatic
Mounting of Runner in Gas-Turbine Engine
(L. V. Goryunov, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH
ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, No 1, Jan-Mar 83)..... 25
- Experimental Study of Thermal State of Turbine Blades With
Partial-Root Cooling
(A. I. Arkhipov, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH
ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, No 1, Jan-Mar 83)..... 26
- Diagnosis of State of Gas-Turbine Engine on Basis of Models
Describing Dynamics of Changes in Measurable Parameters
(B. M. Konyukhov, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH
ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, No 1, Jan-Mar 83)..... 26
- Characteristics of 'Short' Hydrodynamic Dampers on Rotors of
Aircraft Engines With Turbulization of Working Fluid in
Damper Clearance
(A. I. Belousov, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH
ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, No 1, Jan-Mar 83)..... 27
- Parameters Determining Maximum Thrust of Ramjet Engine
(V. I. Bazhanov, A. A. Stepchikov; IZVESTIYA VYSSHIKH
UCHEBNIKH ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, No 1,
Jan-Mar 83)..... 28
- Improvement of Design and Operating Results of Power Turbine
Installations by Mathematical Modeling Methods
(L. A. Shubenko-Shubin; ENERGETIKA I TRANSPORT, No 1,
Jan-Feb 83)..... 29
- Means for Increasing Economy of Piston Internal Combustion
Engines
(M. G. Kruglov; ENERGETIKA I TRANSPORT, No 1, Jan-Feb 83). 29

NAVIGATION AND GUIDANCE SYSTEMS

- Determination of Transfer Functions of Dynamically Tunable
Gyroscope
(A. V. Zbrutskiy, V. M. Slyusar'; PRIKLADNAYA MEKHANIKA,
No 4, Apr 83)..... 31

Course of Vehicle With Consideration of Roll and Trim (L. N. Danilovich; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: PRIFOROSTROYENIYE, No 6, Jun 83).....	31
Error of Triaxial Set of Laser Gyroscopes With Common Initial Bias (V. G. Brykov, A. V. Mochalov; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: PRIFOROSTROYENIYE, No 6, Jun 83)....	32
HIGH-ENERGY DEVICES, OPTICS AND PHOTOGRAPHY	
Compensation of Mirror System Deformations in Radio Telescopes by Secondary Reflector Control (E. E. Gasanov, et al.; IZVESTIYA AKADEMII NAUK AZERBAJDZHANSKOY SSR: SERIYA FIZIKO- TEKHNIЧЕСКИХ I МАТЕМАТИЧЕСКИХ НАУК, No 6, Jun 82).....	33
Two-Coordinate Device for Deflection of Light Beam (V. S. Emdin; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', No 6, Jun 83).....	33
Optical Sensor of Angular Vibrations (D. A. Genkin, S. V. Palochkin; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: MASHINOSTROYENIYE, No 4, Apr 83)....	34
Holographic Methods of Checking Imprecision of Optical Surfaces in Mirror-Type Radiation Concentrator Arrays (A. Abdurakhmanov, et al.; GELIOTEKHNIKA, No 3, May-Jun 83).....	35
Thermophysics of Focusing Mirrors for Laser-Type Fusion Reactors (V. I. Subotin, et al.; ATOMNAYA ENERGIYA, No 1, Jul 83)..	36
Simple Electric-Discharge Laser Emitting in Ultraviolet, Visible and Infrared Regions of Spectrum (N. M. Gamzatov; et al.; PRIBORY I TEKHNIKA EKSPERIMENTA, No 3, May-Jun 83).....	37
Stable Pulsed CO ₂ -Laser Using LG-22 Laser (S. Stonis, E. Shirmulis; PRIBORY I TEKHNIKA EKSPERIMENTA, No 3, May-Jun 83).....	37
Argon Laser With Mode Locking and Intracavity Beam Extraction (K. N. Bakinovskiy, et al.; PRIBORY I TEKHNIKA EKSPERIMENTA, No 3, May-Jun 83).....	38

Vacuumized High-Voltage Current Input Lead for Electron Injector (V. F. Martynov, et al.; PRIBORY I TEKHNIKA EKSPERIMENTA, No 3, May-Jun 83).....	39
Instrument for Analyzing Shape of Scintillation Light Pulses From Thin Scintillators by Method of Individual Photon Count (N. Z. Galunov, et al.; PRIBORY I TEKHNIKA EKSPERIMENTA, May-Jun 83).....	39
Ion-Optical Study of Acceleration of Heavy Ions in EGP-10-1 Tandem Generator (M. Friedrich; PRIBORY I TEKHNIKA EKSPERIMENTA, No 3, May-Jun 83).....	40
Quantum-Mechanical Analysis of Devices for Focusing Charged-Particle Beams (A. M. Shenderovich; PRIBORY I TEKHNIKA EKSPERIMENTA, No 3, May-Jun 83).....	41
Motion of Charged Particles in Electric Field (V. I. Zubov; PRIKLADNAYA MEKHANIKA, No 3, Mar 83).....	41
Method of Ensuring Performance of Optical Instrument for Measuring Temperature of Blades in High-Temperature Turbine (A. P. Merkulov, et al.; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: AVIATSIONNAYA TEKHNIKA, No 1, Jan-Mar 83).....	42
Laser System for Measurement of Deviations of Shape and Location of Surfaces (Yu. N. Kokin, V. V. Leonov; IZMERITEL'NAYA TEKHNIKA, No 5, May 83).....	43
FLUID MECHANICS	
Nonuniform Front of Metal Surface Breakdown Under Laser Radiation (V. P. Veyko, Ye. A. Tuchkova; POVERKHNOST': FIZIKA, KHIMIYA, MEKHANIKA, No 5, May 83).....	44
Base Drag of Bodies With Conical Tail Segment (B. A. Balanin, et al.; VESTNIK LENINGRADSKOGO UNIVERSITETA: MATEMATIKA, MEKHANIKA, ASTRONOMIYA, No 2, Apr 83).....	45
Susceptibility of Boundary Layer at Bodies With Blunt Nose Tip to Acoustic Vibrations of Stream (A. V. Dovgal', V. V. Kozlov; IZVESTIYA SIBIRSKOGO OTDELENIYA AKADEMII NAUK SSSR: SERIYA TEKHNICHESKIKH NAUK, No 8, Jun 83).....	45

Solution of Problems of Dynamics for Noncircular Cylindrical Shells in Fluid (S. A. Vorob'yev; DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA A: FIZIKO-MATEMATICHESKIYE I TEKHNIЧЕСKIYE NAUKI, No 5, May 83).....	46
Flow in Hypersonic Boundary Layer at Delta Wing of Finite Length With Nonzero Angle of Attack (G. A. Dudin; ZHURNAL PRIKLADNOY MEKHANIKI I TEKHNIЧЕСKOY FIZIKI, No 3, May-Jun 83).....	47
General Solution to Problem of Jet Flow Past Wedge (V. I. Troshin; ZHURNAL PRIKLADNOY MEKHANIKI I TEKHNIЧЕСKOY FIZIKI, No 3, May-Jun 83).....	48
Theoretical Study of Effect of Wave Flow on Obstacles (A. M. Ibragimov; IZVESTIYA AKADEMII NAUK AZERBAYDZHANSKOY SSR: SERIYA FIZIKO-TEKHNIЧЕСKIKH I MATEMATICHESKIKH NAUK, No 6, Jun 82).....	48
Oscillations of Free Surface of Liquid in Longitudinally Vibrating Cylindrical Vessel (V. M. Kuz'ma, V. V. Kholopova; PRIKLADNAYA MEKHANIKA, No 3, Mar 83).....	49
Oscillations of Circular Cylinder in Stream of Viscous Compressible Fluid (A. N. Guz'; PRIKLADNAYA MEKHANIKA, No 3, Mar 83).....	49
Effect of Rotation on Heat Transfer in Radial Slot Channel of Turbine Blade (K. M. Iskakov, V. A. Trushin; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, No 1, Jan-Mar 83).....	50
Effect of Supercritical Pressure Drops on Heat Transfer in Turbine Nozzle Arrays (M. N. Bodunov, et al.; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, No 1, Jan-Mar 83).....	51
Modeling Processes of Turbulent Transfer in Supersonic Boundary Layer (Ye. V. Shishov, V. P. Yugov; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, No 1, Jan-Mar 83).....	51
Criterial Approach to Estimating Buildup of Mass and Energy of Working Medium in Gas-Air Duct Spaces of Gas-Turbine Engine for Calculation of Transient Operating Modes (S. Ye. Aksel'rod, V. M. Kofman; IZVESTIYA VYSSHIKH UCHEBNIKH ZAVEDENIY: AVIATIONNAYA TEKHNIKA, No 1, Jan-Mar 83).....	52

MECHANICS OF SOLIDS

Propagation of Flexural Waves in Noncircular Cylinders With Initial Stresses (A. N. Guz', Dz. A. Musayev; DOKLADY AKADEMII NAUK SSSR, No 6, Jun 83).....	53
Nonaxisymmetric Natural Vibrations of Compound Shells of Revolution Containing Liquid (V. A. Gribkov; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, No 5, May 83).....	53
Mathematical Models of Rigid Rotor Mounted in Nonlinear Elastic Rolling Bearings (A. S. Kel'zon; VESTNIK LENINGRADSKOGO UNIVERSITETA: MATEMATIKA, MEKHANIKA, ASTRONOMIYA, No 7, Apr 83).....	54
Nonaxisymmetric High-Frequency Vibrations of Elastic Disks (V. V. Meleshko; DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA A: FIZIKO-MATEMATICHESKIYE I TEKHNIЧЕСKIYE NAUKI, No 5, May 83).....	55
Experimental Determination of Modes and Frequencies of Natural Vibrations of Cantilever Plate by Method of Holographic Interferometry (V. A. Smirnov, K. E. Shcherbina; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, No 7, Jul 83)....	55
Stressed-Strained State of Multilayer Structures Under Pulse Load (V. P. Sizov, S. I. Shumarin; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, No 7, Jul 83).....	56
Vibrations of Nonlinear Beams With Internal Resonances (I. V. Miloserdova, A. I. Potapov; MASHINOSTROYENIYE, No 4, Jul-Aug 83).....	57
Motion of Rotating Rigid Body Along Cylinder Retained by Elastic Yoke (V. I. Pozhuyev; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, No 6, Jun 83).....	57
Twisting Waves in Cylindrical Shell With Viscous Incompressible Fluid (G. I. Shchuruk; PRIKLADNAYA MEKHANIKA, No 4, Apr 83).....	58
Periodic and Double Periodic Solutions of Equations From Technical Elastic Cylindrical Shell Theory (V. T. Golovchan; PRIKLADNAYA MEKHANIKA, No 4, Apr 83)....	58

Solution of the Problem of Bending of Layered Inhomogeneous Hollow Cylinder (A. T. Vasilenko, N. D. Pankratova; PRIKLADNAYA MEKhanika, No 4, Apr 83).....	59
Experimental and Theoretical Study of Elastic-Plastic Bulging of Cylindrical Shells Upon Axial Impact (V. G. Bazhenov, V. K. Lomunov; PRIKLADNAYA MEKhanika, No 6, Jun 83).....	60
Natural Oscillations of a Cylindrical Shell Reinforced by a Rib (Yu. N. Novichkov, N. V. Samarin; PRIKLADNAYA MEKhanika, No 6, Jun 83).....	60
Determination of Critical Dynamic Axial Compressive Stress for Rib Reinforced Multilayer Cylindrical Shells (I. Ya. Amiro, N. Ya. Prokopenko; PRIKLADNAYA MEKhanika, No 6, Jun 83).....	61
Axisymmetrical Elastic Equilibrium of Three Layer Transversely Corrugated Transversely Isotropic Cylinder (Yu. I. Matyash; PRIKLADNAYA MEKhanika, No 6, Jun 83).....	61
Natural Frequencies of Transverse Vibrations of Beams With Holes (I. N. Preobrazhenskiy, Zh. Sh. Shasalimov; PROBLEMY PROCHNOSTI, No 6, Jun 83).....	62
Variational-Difference Method of Calculating Critical Loads for Shells of Revolution (D. V. Babich, N. Ya. Martynova; PROBLEMY PROCHNOSTI, No 6, Jun 83).....	62
Method of Measuring Large Elastoplastic Strains in Dynamically Loaded Plates and Shells (Z. G. Alpaidze, P. P. Lepikhin; PROBLEMY PROCHNOSTI, No 6, Jun 83).....	63
Vibration Diagnosis of Runner Blades in Gas-Turbine Sets (Ye. A. Igumentsev; PROBLEMY PROCHNOSTI, No 5, May 83)....	64
Thermal Stresses in Plate Under Bilateral Laser Treatment (Yu. M. Kolyano, I. I. Bernar; PROBLEMY PROCHNOSTI, No 5, May 83).....	64
Residual Stresses in Blades of Last Stage of Low-Pressure Cylinder in 500 MW Turbine (L. S. Sorkin, V. V. Ugol'nikov; PROBLEMY PROCHNOSTI, No 5, May 83).....	65

Free Deformation of Long Double-Layer Nonhomogeneous Cylinder During Convective Cooling (V. Ya. Belousov; PROBLEMY PROCHNOSTI, No 5, May 83).....	66
Deformation of Spherical Shells Under Wind Load (N. I. Karpov, V. V. Yemel'yanenko; PROBLEMY PROCHNOSTI, No 5, May 83).....	66
Hydrodynamic Damping of Torsional Vibrations of Shaft- Propeller System (G. S. Pisarenko, A. Yu. Beregovenko; PROBLEMY PROCHNOSTI, No 5, May 83).....	67
Natural Flexural Vibrations of Three-Dimensional Beam Array (G. P. Khablo; PRIKLADNAYA MEKHANIKA, No 3, Mar 83).....	68
Optimization of Circular Cylindrical Shell With Given Mass Subject to Stepwise Loading by Axisymmetric External Pressure (V. A. Ryabtsev; PRIKLADNAYA MEKHANIKA, No 3, Mar 83).....	68
Effect of Initial Stresses on 'Backward Wave' in Prestressed Compressible Cylinder-Fluid System (A. M. Bagno; PRIKLADNAYA MEKHANIKA, No 3, Mar 83).....	69
Transient Processes During Interaction of Elastic Solid of Revolution With Fluid (S. K. Nikitin; PRIKLADNAYA MEKHANIKA, No 3, Mar 83).....	70
Thermal Stresses in Thin Spherical Shell With Curvilinear Hole (A. P. Matkovskiy; PRIKLADNAYA MEKHANIKA, No 3, Mar 83)...	70
Stability of Triple-Layer Cylindrical Shells With Discrete Filler Under Axial Compression (N. P. Semenyuk, N. B. Zhukova; PRIKLADNAYA MEKHANIKA, No 3, Mar 83).....	71

TESTING AND MATERIALS

Formation of Regular Microrelief During Centrifugal-Impact Treatment of Surfaces and Calculation of Its Parameters (V. M. Sorokin, S. F. Magnitskaya; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, No 5, May 83).....	72
Model Describing Evolution of Stressed-Strained State in Spherical Fuel Element (V. I. Lelekov, et al.; IZVESTIYA SIBIRSKOGO OTDELENIYA AKADEMII NAUK SSSR: SERIYA TEKHNIЧЕСКИХ НАУК, No 8, Jun 83).....	73

Wear Resistance of Cutter Ceramics (M. M. Aukenov; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: MASHINOSTROYENIYE, No 6, Jun 83).....	73
Treatment of Parabolic Metal Mirrors With Synthetic Superhard Materials (L. G. Gritsev; OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', No 6, Jun 83).....	74
Calculation of Damping Coefficient for Oscillations of Superconducting Sphere in Electromagnetic Field (A. F. Yefremov; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PRIBOROSTROYENIYE, No 6, Jun 83).....	75
Errors in Tying Geophysical Fields by Astronomical Methods (V. I. Yushchenko; IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PRIBOROSTROYENIYE, No 6, Jun 83).....	75
Multichannel Instrument for Precision Measurement of Radiation Energy Emitted by Pulse Lasers (A. V. Larikov, et al.; PRIBORY I TEKHNICA EKSPERIMENTA, No 3, May-Jun 83).....	76
Device for Monitoring Fast-Neutron Flux Density (Ye. R. Astvatsur'yan, et al.; PRIBORY I TEKHNICA EKSPERIMENTA, NO 3, May-Jun 83).....	77
Automated System for High Precision Angle Measurements (O. D. Glukhov, et al.; IZMERITEL'NAYA TEKHNICA, No 5, May 83).....	78

END OF

FICHE

DATE FILMED

4/18/84
